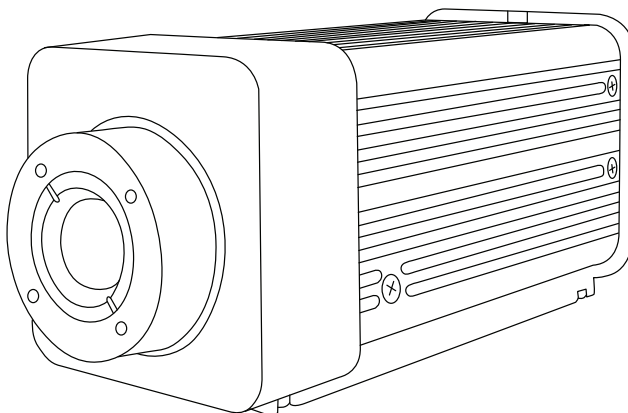# FMX 400 P SERIES IR CAMERA
USER MANUAL

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

**THIS DEVICE IS INTENDED FOR ADJUNCTIVE USE.
NOT MEANT FOR STANDALONE DIAGNOSTICS.**

ICI cameras fall under US Federal Law and Export Control.

Printed in the United States of America.

2105 W. Cardinal Dr.
Beaumont, TX 77705
(866) 861-0788
www.infraredcameras.com

Revision: 2.2021-001

Contents

1. General Description

FMX 400 Series IR cameras are specially designed to take the body temperature of a person and to report the total number of persons scanned. The system has been widely applied for inspection services, and is available for adjunctive use in: hospitals, and sub-acute healthcare settings public areas, i.e. airports.

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 ambient temperature must not be lower than -25 °C, and the original packaging box must be used during transportation.

- 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.

- If the device operates abnormally, please contact the supplier and do not dismantle the device on your own.

- Do not drop or throw the device.

- Do not put the product into a fire.

- It is recommended to calibrate the device annually.

3. Intended Use

FMX 400 Series IR cameras are designed for body surface temperature measurement of infants and adults without contacting the human body.

4. Technical Specifications

Detector Array	UFPA
Pixel Pitch	17 µm
FOV	47° x 35.6°
Measurement Distance	Lens dependent
Pixel Resolution	384 x 288
Spectral Band	8 µm to 14 µm
Thermal Sensitivity (NETD)	< 0.04 °C at 30 °C (40 mK)
Frame Rate	50 Hz NTSC/PAL
Dynamic Range	14-bit
Temperature Range	0 °C to 60 °C
Operation Range	0 °C to 60 °C
Storage Range	-20 °C to 65°C
Humidity	5% to 95% non-condensing
Accuracy	± 0.3 °C
Pixel Operability	> 99 %
Dimensions (without lens)	119 mm x 55 mm x 55 mm (L x W x H +/- .5 mm)
Power	DC 110V 10 - 36, < 3 W
Weight (without lens)	< 370 g
Interface	RJ-45 Ethernet
Video	raw data
Emissivity Correction	0.01 to 1.0
IP Rating	IP 54
Shutter	Built-in shutter

5. Structure

5-1 Appearance
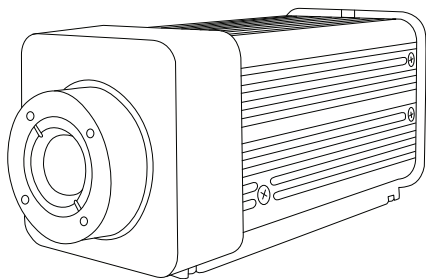
5-2 Definitions of Housing Interface
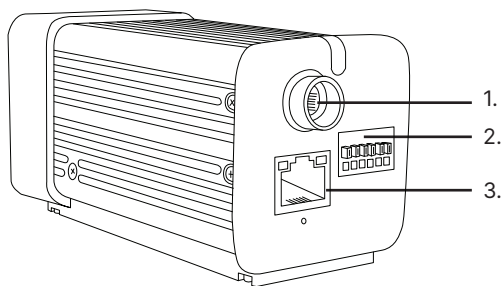
1. Coaxial plug interface

2. Analog I/O - reserved
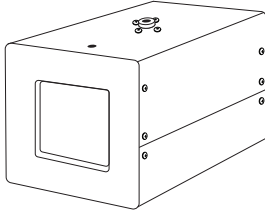
3. RJ-45 Internet access

6. Package Contents

Temperature Reference
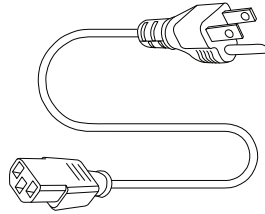
AC Power Cord
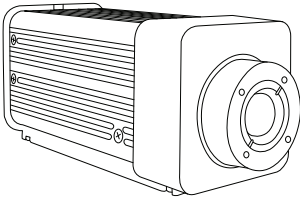
FMX Series IR Camera
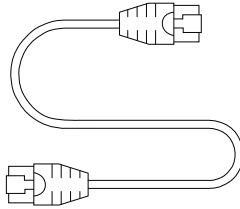
Ethernet Cable
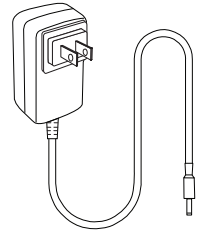
Power Adapter
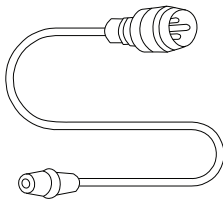
Coaxial Cable
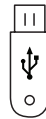
Software USB Drive

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 AND RELATIVE HUMIDITY RANGE FROM 10% TO 50%.

A.

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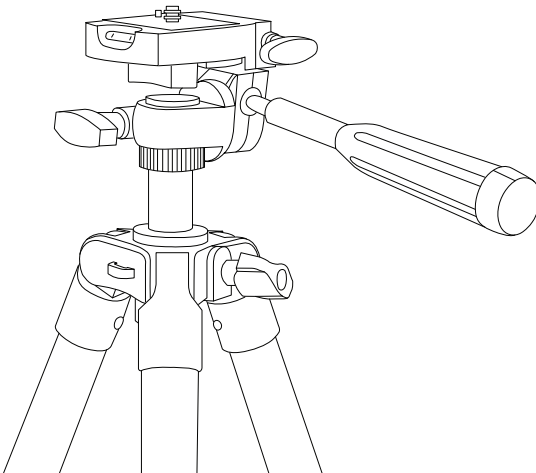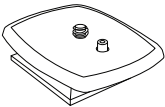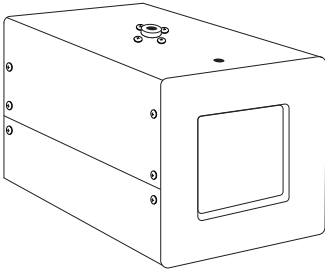
B.

Plug power cord into Temperature Reference.
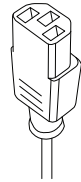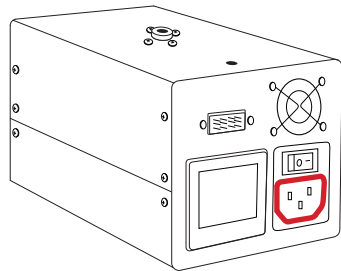
C.

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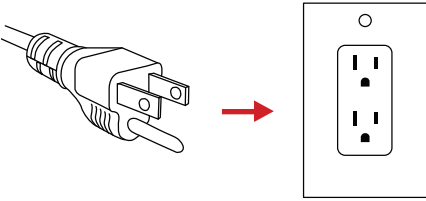
D.

Mount the FMX Series IR Camera to a tripod using the ¼-20 mount.
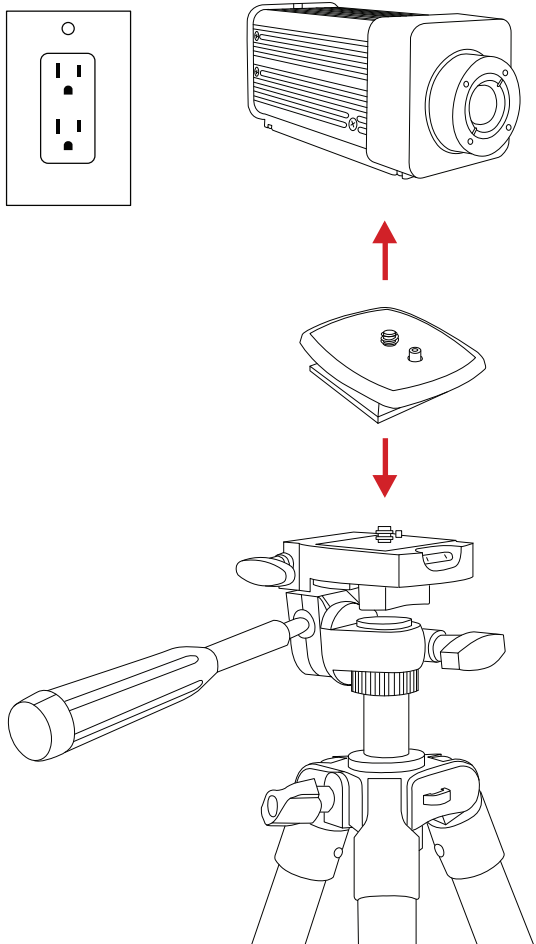
MAKE SURE TRIPODS DO NOT BLOCK THE DIRECT PATH OF PERSON(S) TO BE IMAGED TO ENSURE THE EQUIPMENT WILL NOT BE MOVED OR KNOCKED DOWN. USING A DIVIDING BARRIER WILL HELP KEEP TRIPODS SEPARATE FROM THE PATH.

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 Ethernet cable into the Ethernet port of the FMX Series IR Camera.
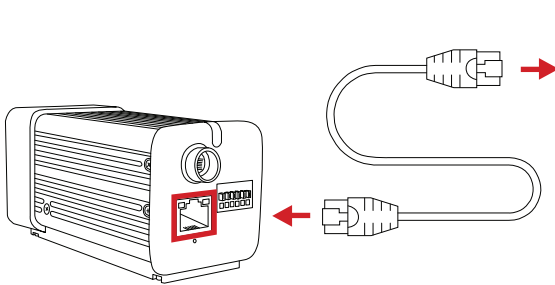
F.

Plug the other end of the Ethernet cable into the Ethernet port of the computer.
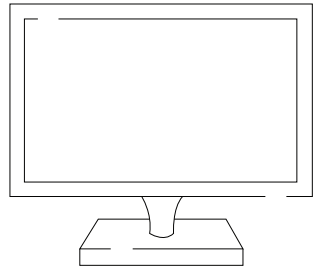
G.

Attach coaxial cable to back of the FMX Series IR Camera. Right to tighten. Left to loosen.
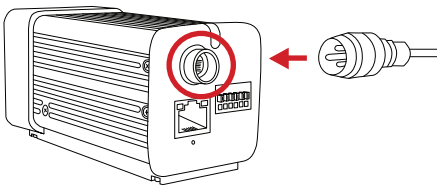
H.

Plug jack end of power adapter into barrel end of coaxial cable.

I.

Plug power adapter into a 110/120V
electrical outlet.
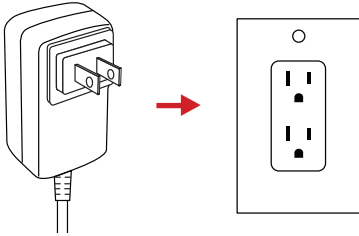
J.

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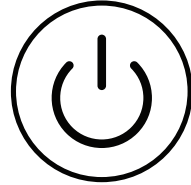
ALLOW AT LEAST 45 MINUTES FOR THE TEMPERATURE REFERENCE SOURCE TO WARM UP. THIS WILL PROVIDE THE MOST ACCURATE SKIN TEMPERATURE MEASUREMENTS.

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
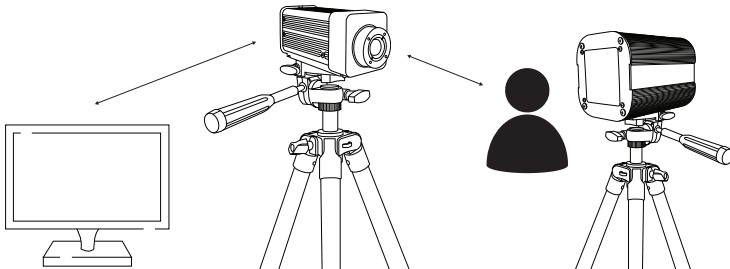
GRAPHIC FOR ILLUSTRATION PURPOSES ONLY

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 FMX 400 comes configured with static IP address for the infrared camera. The infrared camera lies at 192.168.1.123. Connecting the 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.
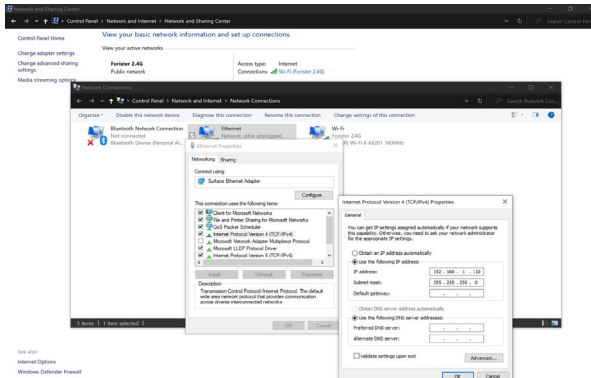
Be sure the static IP address is set by doing the following:

1. Click on Windows icon.

2. Click on Settings.

3. Click on Network and Internet.

4. Click on Ethernet.

5. Click on Change Adapter Settings.

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.

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/

8-3 Recommended System Requirements

- **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

SOFTWARE DISPLAYS BEST WITH 1920 X 1080 RESOLUTION OR ABOVE.

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 cloth or lens wiping paper and dip in alcohol or lens wiping liquid. Gently wipe the lens surface from the middle to the edge, paying attention to not crack the lens, or use too much wiping liquid. If the lens is still not clean, replace the cloth and repeat operation.

9-2 Device Calibration

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

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

Continues

10-3 The Traffic Flow

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

    ☐ 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:

Temperature Measuring Workflow Example
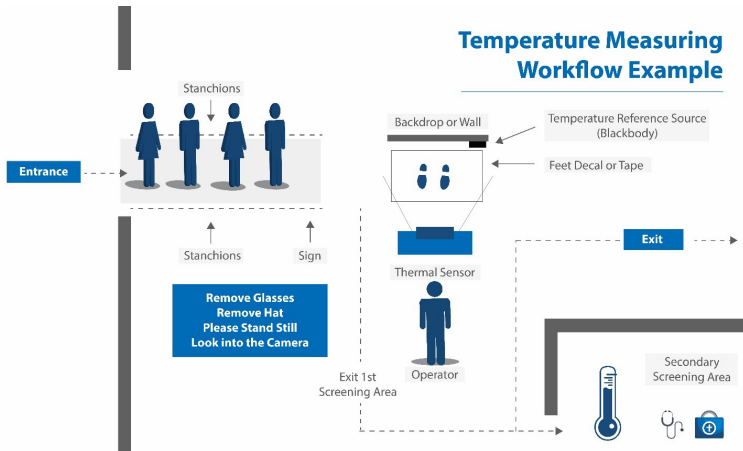
10-5 IR Camera Placement

☐ 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 4 – 5 feet
    - ☐ The individual's face and Temperature Reference Source should be in the frame
- ☐ Distance to Temperature Reference Source: 6-7 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
- ☐ 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 & Ethernet 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

- For FMX 400 cameras:

    ◦ Adjust electronic focus with middle button

    ◦ Close and reopen software

    ◦ Try newer or different version of IR Flash STM software

    ◦ Restart computer

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 or 37 °C, depending on readout of Temperature Reference Source

    ◦ Temperature Reference Source has crosshair over it

    ◦ In Inspection System software:

        - Make sure that facial detection is on

        - Turn on core body compensation

        - Set automatic compensation to environmental temperature

- 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

- Camera is in focus

- Reconnect power to camera & Temperature Reference Source

- Temperature Reference Source power switch is on

- Camera and Temperature Reference Source powered on for several minutes

- Ensure temperatures on back of Temperature Reference Source match

- Restart Computer

- 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.
2105 W. Cardinal Dr.
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.