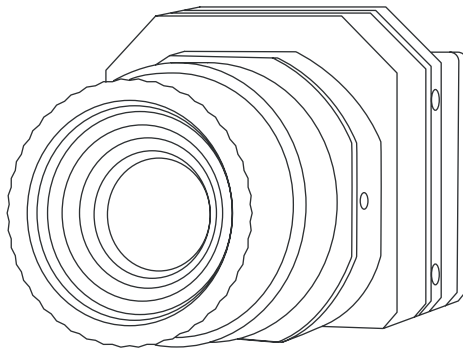




# HELIOS 640 P-SERIES

## USER MANUAL

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



ICI cameras fall under US Federal Law and Export Control.

## Revision History

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03.2024-001 Document created

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# 1. Disclaimers

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## 1-1 Terms and Conditions

Warranty Terms and Condition of Sale are made available online at:

<https://thermalcamera.com/support/terms-and-conditions-of-sale/>

## 1-2 U.S. Government Regulations

This product may be subject to U.S. Export Regulations. Please send any inquiries to [support@thermalcamera.com](mailto:support@thermalcamera.com)

## 1-3 Copyright

© 2024, Thermal Camera. All rights reserved worldwide. No parts of the software including source code may be reproduced, transmitted, transcribed or translated into any language or computer language in any form or by any means, electronic, magnetic, optical, manual or otherwise, without the prior written permission of Thermal Camera

The documentation must not, in whole or part, be copied, photocopied, reproduced, translated or transmitted to any electronic medium or machine readable form without prior consent, in writing, from Thermal Camera Names and marks appearing on the products herein are either registered trademarks or trademarks of Thermal Camera and/or its subsidiaries. All other trademarks, trade names or company names referenced herein are used for identification only and are the property of their respective owners.

## 1-4 Quality Assurance

Thermal Camera is committed to a policy of continuous development; therefore we reserve the right to make changes and improvements on any of the products without prior notice.

## 1-5 Customer Help

For customer help, visit:

<https://thermalcamera.com/support/>

E-mail:

[support@thermalcamera.com](mailto:support@thermalcamera.com)

## 2. User Notice

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### 2-1 Calibration

Annual calibration to the thermal camera is recommended. Contact customer service to schedule maintenance.

### 2-2 Accuracy

For very accurate results, we recommend that you wait a minimum of 5 minutes after you have started the camera before measuring a temperature.

### 2-3 Cybersecurity

After the products are connected to the Internet, they may face risks including but not limited to network attacks, hacker attacks, virus infections, etc. The company will not be responsible for the abnormal operation of the products and any loss or liability caused therefrom shall be at your own risk.

### 2-4 Disposal of Electronic Waste

Electrical and electronic equipment (EEE) contains materials, components and substances that may be hazardous and present a risk to human health and the environment when waste electrical and electronic equipment (WEEE) is not handled correctly.

Equipment marked with the below crossed-out wheeled bin is electrical and electronic equipment. The crossed-out wheeled bin symbol indicates that waste electrical and electronic equipment should not be discarded together with unseparated household waste, but must be collected separately.

All local authorities have established collection schemes under which residents can dispose of equipment at a recycling center or other collection points, or WEEE will be collected directly from households. More detailed information is available from the administration of the relevant local authority. Always dispose of waste in accordance with local, state, and federal regulations.



## 2-5 Intended Use

The ICI Helios 640 P-Series infrared camera captures 640 x 512 radiometric images and provides accurate temperature measurements up to 500°C (932°F). A high performance device, it is compact, lightweight, and easy to install in tight spaces. Integrate the Helios into aerial systems and handheld products to meet a range of application requirements

Environment of use: industrial and petrochemical buildings, electrical plants, security rooms, science labs, environmental conservatories, UAV/UAS integrations, aerial applications, among others.

You agree that this product is for civilian use only, and shall not use applications that may infringe the rights of third parties, medical and safety devices or other applications where product failure may lead to life-threatening or personal injury, as well as weapons of mass destruction, chemical and biological weapons, nuclear explosions, unsafe use of nuclear energy, dangerous or humanitarian purposes. Any loss or liability caused therefrom shall be at the your own risk.

## 2-6 Manual Update

The user manual will be updated from time to time. To access the latest manuals, translations of manuals, and notifications, go to:

<https://thermalcamera.com/product-resources/>

The manufacturer reserves the right to alter the specifications of the product without prior notification. The manufacturer allows himself the right to modify without any preliminary opinion the technical specifications of the product.

## 2-7 Scope of Application

Thermal Camera issues generic manuals that cover several cameras within a model line.

This means that this manual may contain descriptions and explanations that do not apply to your particular camera model. This manual may contain technical inaccuracies or typographical errors.

## 2-8 Authoritative Versions

The authoritative version of this publication is English. In the event of divergences due to translation errors, the English text has precedence.

Any late changes are first implemented in English. Other languages may or may not be available.

## 2-9 Training

To read about infrared training, visit:

<https://infraredtraininginstitute.com/>

### 3. Safety Information

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- Operation is subject to the following two conditions: 1 This device may not cause harmful interference, and 2 this device must accept any interference received, including interference that may cause undesired operation.
- This device must be installed by qualified service personnel or system installation personnel.
- Do not disassemble or modify the thermal device. If the device operates abnormally, please contact the supplier and do not dismantle the device on your own.
- Do not point the imager (with or without the lens cover) at intensive energy sources, e.g. devices that emit laser radiation, or the sun. This can affect the accuracy of the camera, and cause damage to the detector.
- Do not use the imager in temperatures higher than 150°C (302°F) or lower than -20°C (-4°F). High/low temperatures can cause damage to the device.
- Do not cut, alter, or place heavy items on the device. These actions may cause an electric short leading to fire or electrocution.
- 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 put holes in the device with objects. Damage to the device may occur.
- Do not hit the device with a hammer or apply strong impacts or electric shocks to it. Damage to the device may occur.
- Do not put the device in or near a fire, stove or other high-temperature locations. Damage or ignition of the device may occur.
- Do not put the device in direct sunlight or other high-temperature locations. Damage or ignition of the device may occur.
- Do not get water or salt water on the device or permit the device to get wet. Damage to the device may occur.
- Remove any water or moisture on the device before you install it. Damage to the device may occur.
- If there are fluids on the device and the fluid gets into the eyes, do not rub the eyes. Flush well with water and immediately get medical care.
- Always dispose of device in accordance with local, state and federal regulations.
- Do not use the device if, when used, there is a smoke emitted from the device, the device feels excessively hot, changes color, changes shape, or is in an unusual condition. Speak with a sales office if one or more of these problems occurs.
- Do not use liquids to clean the electronics.
- Clean the case with a damp cloth and a weak soap solution. Do not use abrasives, isopropyl alcohol, or solvents to clean the case or lens/screen.



- Be careful when cleaning the infrared lens. Do not clean the infrared lens too vigorously. This can damage the anti-reflective coating.
- Avoid condensation. Taking the device from cold to hot will cause condensation in the thermal imager. To protect the device, power on the device and wait until it becomes warm enough for the condensation to evaporate.
- Keep device out of reach of children.
- 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.
- Transport: During transportation and storage the original packaging box must be used.
- Storage: If you do not use the imager for a long period of time, put the device in a cool and dry environment.
- It is recommended to calibrate the device(s) annually.

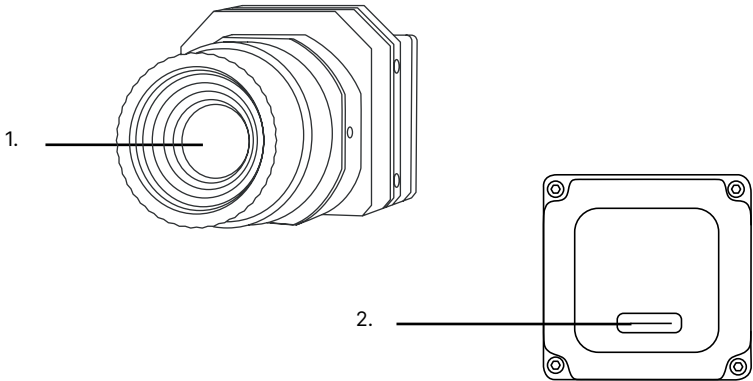
**THE ENCAPSULATION RATING IS ONLY APPLICABLE WHEN ALL THE OPENINGS ON THE CAMERA ARE SEALED WITH THEIR CORRECT COVERS, HATCHES, OR CAPS. THIS INCLUDES THE COMPARTMENTS FOR DATA STORAGE, BATTERIES, AND CONNECTORS.**

## 4. Technical Specifications

	Helios 640
Pixel Resolution	640 x 512
Accuracy	$\pm 2^{\circ}\text{C}$ ( $\pm 3.6^{\circ}\text{F}$ ) or $\pm 2\%$
Temperature Range	Standard: $-20^{\circ}\text{C}$ to $150^{\circ}\text{C}$ ( $-4^{\circ}\text{F}$ to $302^{\circ}\text{F}$ )/ Industrial: $0^{\circ}\text{C}$ to $500^{\circ}\text{C}$ ( $32^{\circ}\text{F}$ to $932^{\circ}\text{F}$ )
Operation Range	$-40^{\circ}\text{C}$ to $80^{\circ}\text{C}$ ( $-40^{\circ}\text{F}$ to $176^{\circ}\text{F}$ )
Storage Range	$-45^{\circ}\text{C}$ to $70^{\circ}\text{C}$ ( $-49^{\circ}\text{F}$ to $158^{\circ}\text{F}$ )
Detector Type	Uncooled VOx microbolometer
Pixel Pitch	14 $\mu\text{m}$
Focal Length	12.5 mm
Focus	Manual
FOV	$39^{\circ}\times 32^{\circ}$
Measurement Distance	Lens Dependent
Spectral Band	8 $\mu\text{m}$ to 14 $\mu\text{m}$
Thermal Sensitivity (NETD)	$< (20 \text{ mK}) 0.02^{\circ}\text{C}$ at $30^{\circ}\text{C}$ ( $86^{\circ}\text{F}$ )
Frame Rate	30 Hz P-Series or 7.5 S-Series
Dynamic Range	14-bit
Humidity	5% to 95% non-condensing
Pixel Operability	$> 99\%$
Shock	40 G
Vibration	4.3 G
Dimensions (without lens)	45 mm x 45 mm (W x H $\pm 0.5$ mm) (1.77" x 1.77" (W x H $\pm 0.02$ "))
Power	4V ~ 6V DC, $< 1.4\text{W}$
Weight (without lens)	76 g (2.68 oz)
Interface	USB Type-C
Video	Raw data
Emissivity Correction	0.01 to 1.0
IP Rating	IP54
Internal non-uniformity correction (NUC)	
Aluminum enclosure	

## 5. Structure

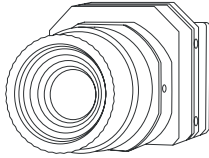
### 5-1 Appearance and Definitions of Housing Interface



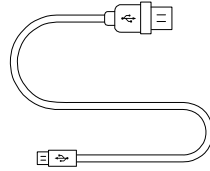
1. Germanium Lens
2. USB Type-C Slot

## 6. Package Includes

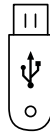
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Helios 640 Camera



USB to USB Type-C Cable



Software USB Drive

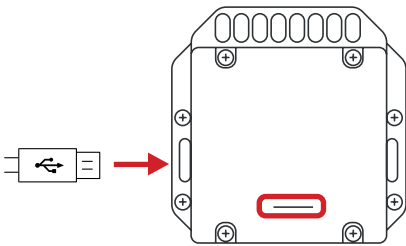
**ENSURE ALL SYSTEM EQUIPMENT AND COMPONENT ITEMS ARE PRESENT BEFORE BEGINNING INSTALLATION**

## 7. Quick Start Instructions

### 7-1 Plug n' Play Setup

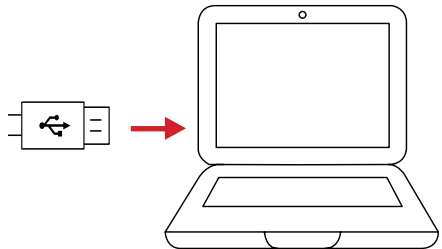
A.

Plug the Type-C end of the USB cable into the back of the Helios 640 camera.



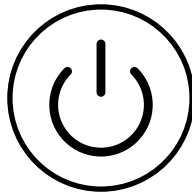
B.

Plug the other end of the USB cable into your computer.



3.

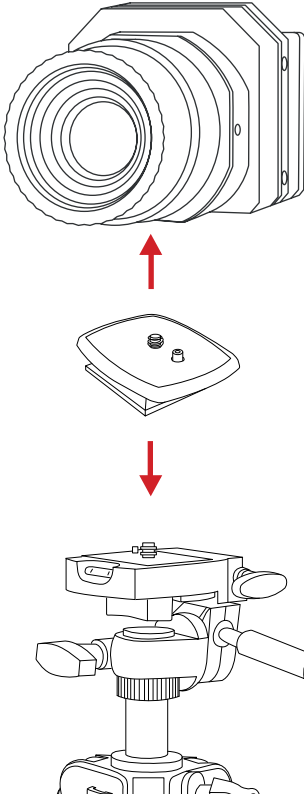
Power on computer.



## 7-2 Tripod Setup

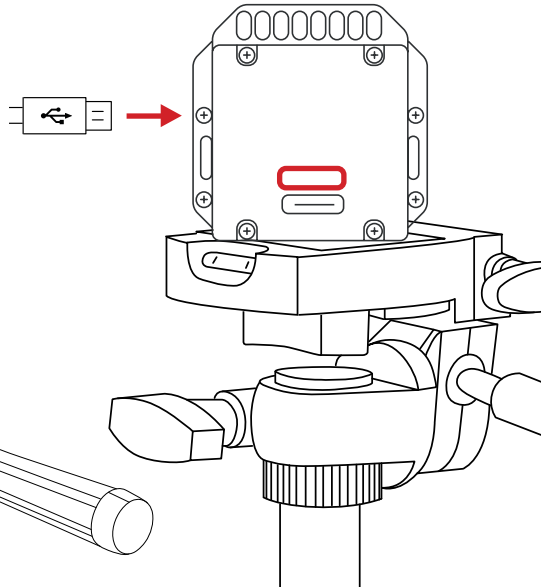
A.

Mount the Helios 640 camera to a tripod using the 1/4-20 mount.



B.

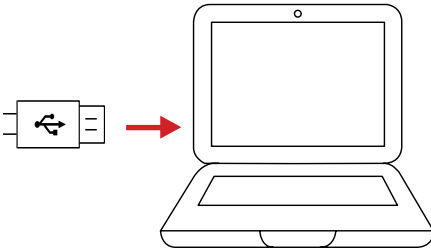
Plug the Type-C end of the USB cable into the back of the Helios 640 camera.



**MAKE SURE TRIPODS DO NOT BLOCK THE DIRECT PATH OF FOOT TRAFFIC TO ENSURE THE EQUIPMENT WILL NOT BE MOVED OR KNOCKED DOWN. USING A DIVIDING BARRIER WILL HELP KEEP TRIPODS SEPARATE FROM PATHS.**

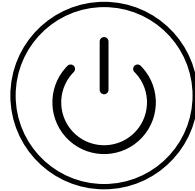
C.

Plug the other end of the USB cable into your computer.



D.

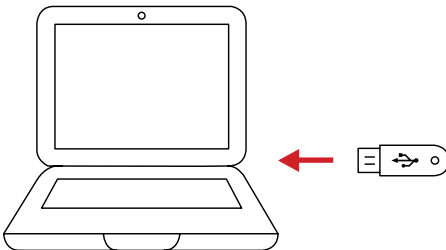
Power on computer.



### 7-3 Software

A.

Install IR Flash software using the software USB drive. Refer to the IR Flash User Manual for instructions.



B.

Once installed, launch IR Flash software by double-clicking the associated desktop icon.

## 8. Operation Instructions

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### 8-1 Power On/Off the Device

After installing the thermal camera in the preferred position, use the cable to connect the thermal camera and the computer as normal. The device pulls power from the computer and powers on when the computer is powered on. Temperature measurement and analysis is most accurate after 10 minutes. Monitoring is available through the computer software (see Chapter 8-2 IR Flash Pro)

**THE THERMAL IMAGER NEEDS SUFFICIENT TIME TO WARM-UP FOR THE MOST ACCURATE TEMPERATURE MEASUREMENTS AND BEST IMAGE QUALITY. THIS TIME CAN OFTEN VARY BY ENVIRONMENTAL CONDITIONS. IT IS BEST TO WAIT A MINIMUM OF 10 MINUTES FOR THE DEVICE TO COMPLETELY WARM-UP.**

**AFTER POWERING OFF, WAIT TEN SECONDS BEFORE ATTEMPTING TO POWER THE DEVICE ON AGAIN.**

### 8-2 IR Flash Pro

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 Pro web page under the Downloads section or at this address:

<https://infraredcameras.com/ir-flash-pro-manual/>

- Processor: Intel i5 Quad core or above
- RAM: 4 GB or above
- OS: Windows 8/8.1/10
- Hard Drive: 256 GB or above
- Resolution: 1920 × 1080



## 9. Cleaning and Maintenance

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### 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 the device(s) re-calibrated annually. Contact customer service to schedule maintenance.

### 9-4 Storage

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

**DO NOT USE CORROSIVE CLEANING SOLUTIONS ON THE OPTICAL GLASS COMPONENTS. DISINFECT THE CAMERA SURFACE REGULARLY WITH A NON-CORROSIVE SANITIZING PRODUCT.**

**CALIBRATE YOUR DEVICES ANNUALLY. CONTACT CUSTOMER SERVICE TO SCHEDULE MAINTENANCE.**

## 10. Troubleshooting

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If the user encounters any problems while using the imager, refer to the following options. If the problem persists, disconnect the power and contact the customer support department.

### 10-1 Thermal imager does not power on

- Ensure the cables are plugged in correctly
- Unplug the cable and plug it back in
- Power off the device; then, power it back on
- Power off the computer and power it back on

### 10-2 Thermal imager shuts off unexpectedly

- Ensure the cables are plugged in correctly

### 10-3 No thermal image

- Open the lens cap
- If lens is foggy, use professional equipment to clean the lens

### 10-4 Unclear or dark visible images

- Turn on lights in imaging area
- If lens is foggy, use professional equipment to clean the lens

### 10-5 Temperature readings are incorrect

- Power off the device; then, power it back on
- Ensure the correct temperature range is selected
  - The default temperature range is -20 °C to 150 °C (-4 °F to 302 °F)
  - When measuring high temperature objects ensure the temperature range is set to the 0 °C to 500 °C (32 °F to 932 °F) range
- Device is at proper height
- Ensure device is in focus
- Perform a NUC operation

## 11. About ICI

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Website: [www.infraredcameras.com](http://www.infraredcameras.com)

You may reach a representative by phone or email.

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.