Revision: 07.2023-001

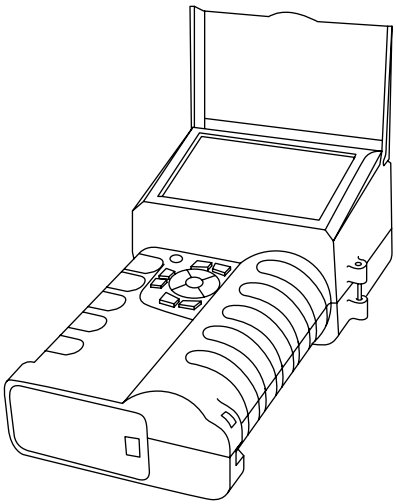
ICI | INFRARED CAMERAS INC

Industry

CORONA CAMERA

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.

2105 W. Cardinal Dr. Beaumont, TX 77705

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

Revision History

07.2023-001	Document created

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1. Disclaimers

1-1 Terms and Conditions

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

https://cameras.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@cameras.com

1-3 Copyright

© 2023, Infrared Cameras, Inc. 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 Infrared Cameras, Inc.

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1-4 Quality Assurance

Infrared Cameras, Inc. 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://cameras.com/support/

E-mail:

support@cameras.com

2. User Notice

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

ICI's Corona Camera is a non-destructive testing device which detects, pinpoints, and documents flash arc corona and arcing partial discharge.

Environment of use: overhead transmission lines, high voltage substations, electrical utilities, research institute, electrical inspections, service providers, laboratories, 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://cameras.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

Infrared Cameras, Inc. 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 training, visit:

https://traininginstitute.com/

3. Safety Information

- 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.
- Do not disassemble or modify the device.
- 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 an ambient temperature outside of the operation range. High/low temperatures can cause damage to the device.
- Always charge the battery in the special temperature range. The temperature range to charge the battery is 0°C to 40°C (32°F to 104°F). Charging the battery at temperatures outside this range can cause the battery to become hot or to explode. It can also decrease the performance or the life cycle of the battery.
- Do not continue to charge the battery if it does not become charged in the specified charging time. If you continue to charge the battery, it can become hot and cause an explosion or ignition. Injury to persons can occur.
- Do not attach the batteries directly to a car's cigarette lighter socket. Using the incorrect equipment can cause the battery to become hot or cause an explosion.
- Only use the correct equipment to discharge the battery. Using the incorrect equipment can decrease the performance or the life cycle of the battery. Using the incorrect equipment can cause the battery to become hot or cause an explosion.
- Do not connect the positive terminal and the negative terminal of the battery to each other with a metal object (such as wire). Damage to the batteries can occur.
- The battery contains safety and protection devices which, if they become damaged, can cause the battery to become hot, or cause an explosion or an ignition.
- Do not put holes in the battery with objects. Damage to the battery may occur.
- Do not hit the battery with a hammer or apply strong impacts or electric shocks to it. Damage to the battery may occur.
- Do not put the battery in or near a fire, stove or other high-temperature locations. Damage or ignition of the battery may occur.
- Do not put the battery in direct sunlight or other high-temperature locations. Damage or ignition of the battery may occur.
- Do not get water or salt water on the battery or device or permit the device or battery to get wet. Damage to the battery may occur.
- Remove any water or moisture on the battery before you install it. Damage to the battery may occur.

- Do not solder directly onto the battery. Damage to the battery may occur.
- If there is a leak from the battery and the fluid gets into the eyes, do not rub the eyes. Flush well with water and immediately get medical care.
- Always dispose of battery in accordance with local, state and federal regulations.
- Do not use the battery if, when used, charged, or placed in storage, there is an unusual smell from the battery, the battery feels hot, changes color, changes shape, or is in an unusual condition. Speak with a sales office if one or more of these problems occurs.
- 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 lens. Do not clean the lens too vigorously. This can damage the lens.
- Avoid condensation. Taking the imager from cold to hot will cause condensation in imager. To protect the imager, power on the device and wait until it becomes warm enough for the condensation to evaporate.
- Keep device out of reach of children.
- Storage: If you do not use the imager for a long period of time, put the device in a cool and dry environment. Batteries should be stored in an ambient temperature of -20°C to 20°C (-4°F to 67.9°F). Lithium batteries will discharge time and should be fully charged before storage. It is recommended to fully recharge the batteries every 3 months to prevent damage. Store the device in an ambient temperature of -25°C to 60°C (-13°F to 140°F).

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

Pixel Resolution	640 x 480
Operation Range	-15 °C to 50 °C (5 °F to 122 °F)
Storage Range	-25 °C to 60 °C (-13 °F to 140 °F)
Detector Array	Custom
Overlay Accuracy	< 1 Mrad
Focus	Automatic/Manual
Focus Range	1.5 m ~ ∞ (4.92' ~ ∞)
FOV	7.2° x 5.4°
Spectral Band	240 nm to 280 nm
UV Sensitivity	2.2 × 10 - 18 W/cm2
Minimum Discharge Detection	1pC @ 10 m (32.81')
Minimum RIV Sensitivity	3.6 dBμV @ 1 MHz
Dynamic Range	14-bit
Humidity	90% non-condensing
Pixel Operability	> 99 %
Dimensions (without lens)	290 mm x 136 mm x 86 mm (L x W x D ± 0.5 mm) (11.41" x 5.35" x 3.39" (L x W x H ± 0.02"))
Weight	1.38 kg (3.04 lbs)
Battery	Li-ion, rechargeable/replaceable
Power	DC 9V ~ 12V, ≤10.8
Adapter	AC: 110V ~ 240V or DC: 50 Hz ~ 60 Hz/9V 3.8A
Operation Time	4 hours
Zoom	Standard: 2x Optional: 4x
Interface	MicroUSB, SD
Video Format	AVI, > 1 hr video, 1 GB
Video Output	Standard: PAL or NTSC Optional: CVBS/HDMI video out
Image Modes	Visible, UV, combined
Image Format	JPG
Image Storage	SD Card (up to 32 GB)
UV Image Polarity	White, red, green, yellow, purple
Media Download	Standard: card reader, USB Optional: Wi-Fi
Power Management	Sleep mode or automatic shutdown

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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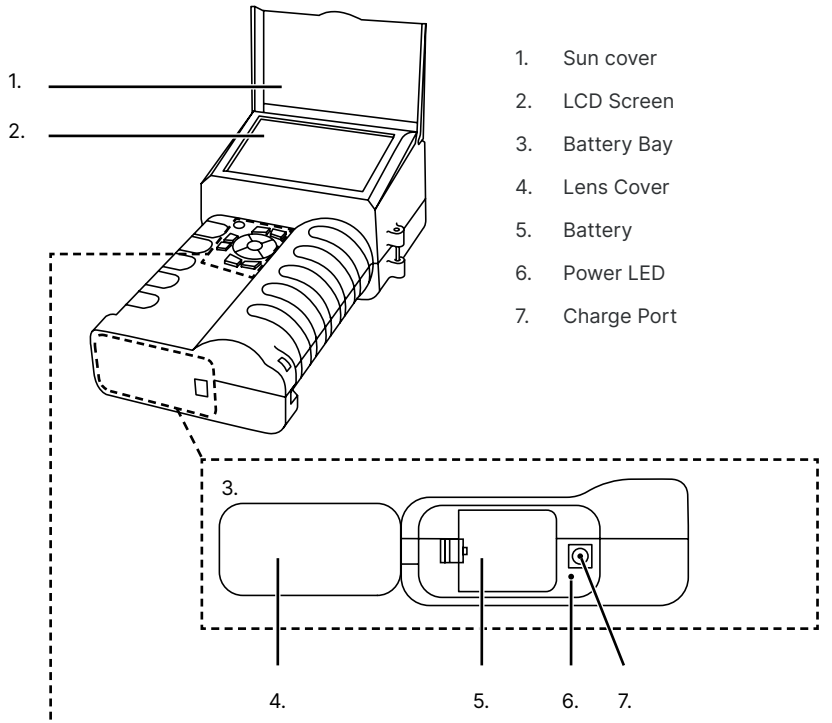
Screen	5” LCD screen, 800 x 480
IP Rating	IP54, CE IEC 010-1
Visible Camera	Detector Array: custom Pixel Resolution: 640 × 480 Minimum Visible Light Sensitivity: 0.1 Lux Focus: automatic/manual Focus Range: 1.5 m ~ ∞ (4.92’ ~ ∞) Zoom: 12x digital or 10x optical Image Polarity: color or black and white

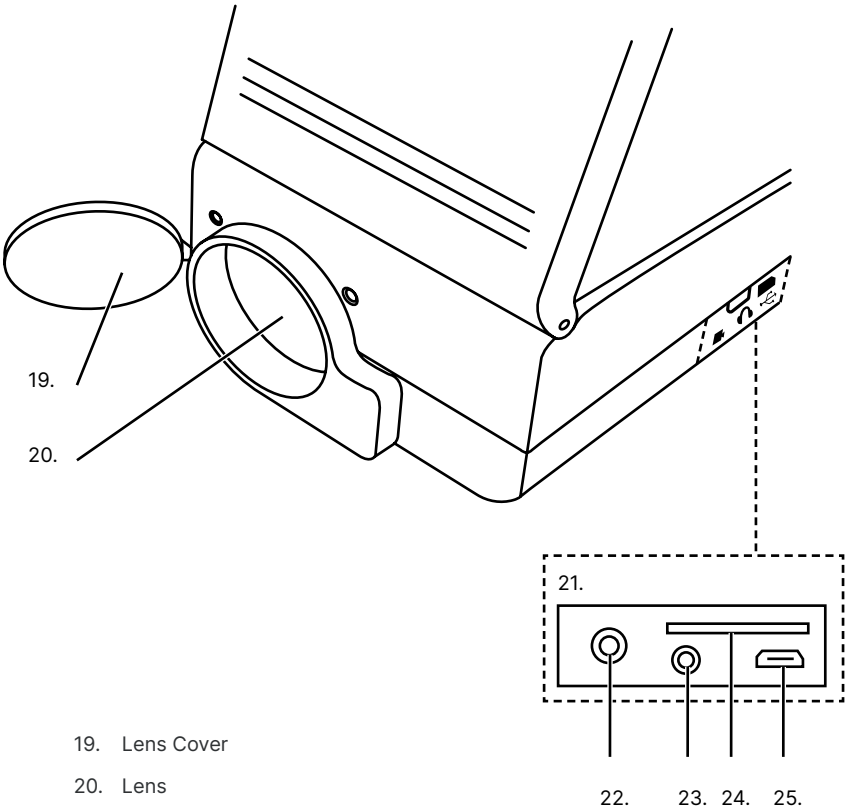
5. Structure

5-1 Appearance and Definitions of Housing Interface



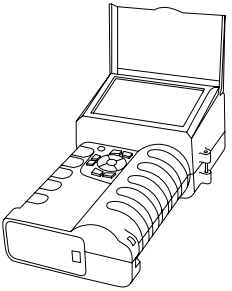
1. Sun cover
2. LCD Screen
3. Battery Bay
4. Lens Cover
5. Battery
6. Power LED
7. Charge Port

8. Power
9. Capture
10. Focus In/Zoom In
11. Focus Out/Zoom Out
12. Gain +
13. Mode
14. Record
15. Gain -
16. OK/Menu
17. **Navigation (up, down, left, right)**
18. Previous/Back (Cancel)

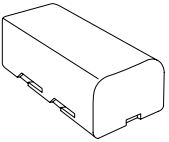


19. Lens Cover
20. Lens
21. Interface
22. AV Slot
23. Headphone/Microphone Slot
24. SD Card Slot
25. Micro USB

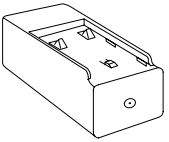
6. Package Includes



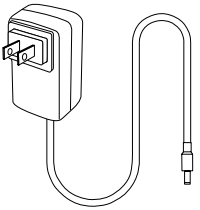
Corona Camera



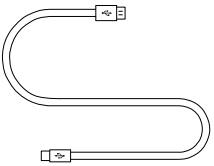
Battery x2



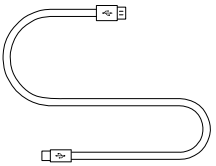
Battery Charger



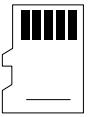
Power Adapter



USB to Type-C Cable



Micro USB to USB



Memory Card

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

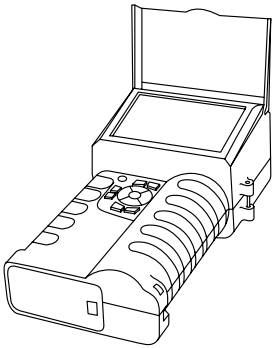
7. Quick Start Instructions

7-1 Tripod Setup

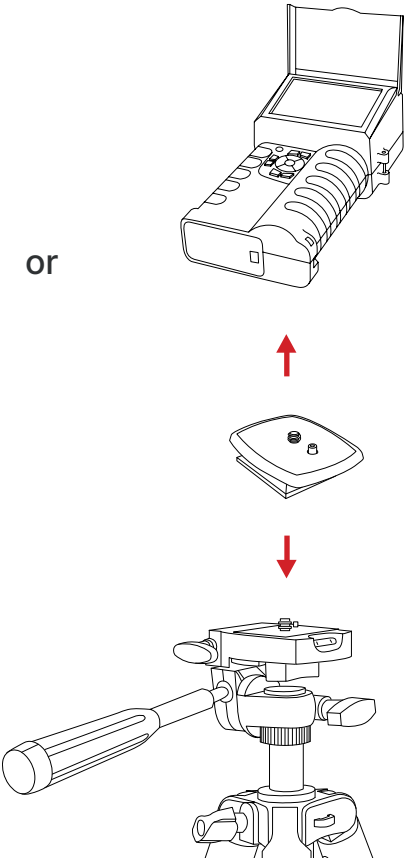
A.

Mount the fully charged Corona Camera to a tripod using the ¼”-20 mount located on the back of the device handle.

The Corona Camera can be used as a handheld device.



or



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.

TURN ON THE CAMERA BY PRESSING AND HOLDING THE POWER BUTTON FOR AT LEAST TWO SECONDS.

B.

Power on device.

PRESS AND HOLD THE POWER BUTTON FOR MORE THAN 5 SECONDS TO SHUT DOWN THE CAMERA.

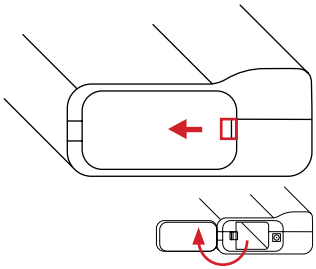
THE IMAGER NEEDS SUFFICIENT WARM-UP TIME FOR THE MOST ACCURATE TEMPERATURE MEASUREMENTS AND BEST IMAGE QUALITY. THIS TIME CAN OFTEN VARY BY ENVIRONMENTAL CONDITIONS. IT IS BEST TO WAIT A MINIMUM OF 10 MINUTES FOR THE DEVICE TO COMPLETELY WARM-UP.

7-2 Battery Installation

MAKE SURE TO HOLD THE CAMERA FIRMLY IN BOTH HANDS WHEN REMOVING OR REPLACING BATTERY OR ATTACHING OR REMOVING THE BATTERY BAY COVER.

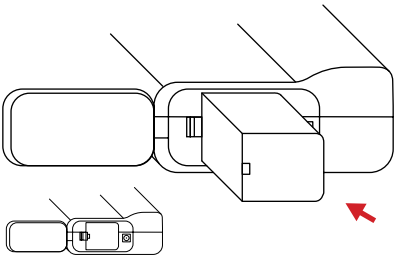
A.

Press and hold the battery bay button and lift upwards to open the battery bay cover.



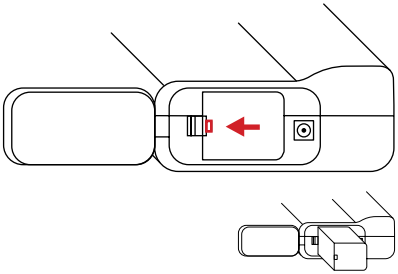
B.

Ensure metal contacts are aligned, then push battery into battery bay.



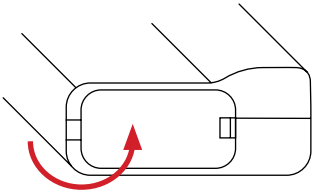
C.

To replace a battery held in the battery bay push the battery buckle. Battery will be ejected.



D.

Close lid.

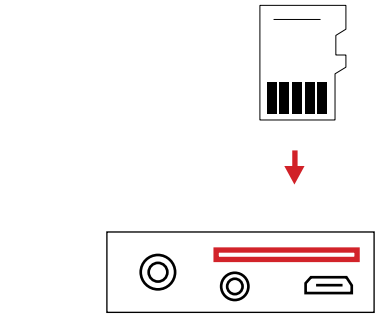


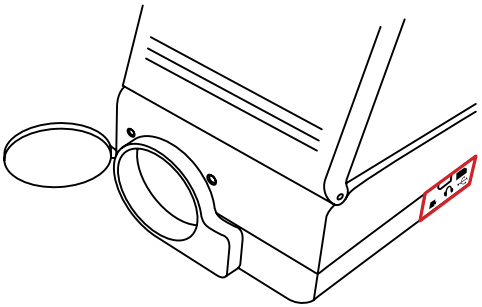
DO NOT FORCE THE BATTERY INTO THE BATTERY BAY. IF USER FEELS SIGNIFICANT RESISTANCE REMOVE THE BATTERY AND ENSURE METAL CONTACTS ARE ALIGNED BEFORE TRYING TO PLACE BATTERY INTO THE BATTERY BAY.

7-3 Memory Card Installation

A.

Insert the Memory Card into the side of the Corona Camera device until a clicking sound is heard.





DO NOT FORCE MEMORY CARD INTO THE SLOT. THE SIDE OF THE CARD WITH CONTACT PINS MUST BE INSERTED FIRST. IF THERE IS RESISTANCE FLIP THE CARD AROUND AND TRY AGAIN. TO EJECT THE MEMORY CARD PRESS UNTIL A CLICK IS HEARD AND THEN RELEASE. MEMORY CARD WILL BE EJECTED.

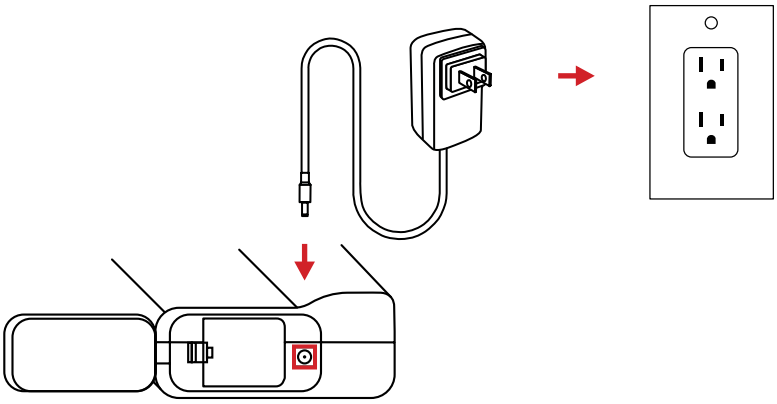
7-4 Charging Instructions: Option 1

A.

While a battery is inside the device, plug the power adapter into the battery bay jack slot of the Corona Camera device.

D.

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



WHEN THE BATTERY BAY IS EMPTY THE INDICATOR SHOWS GREEN. THE LIGHT TURNS RED WHEN THE BATTERY IS PLACED AND CHARGING. WHEN THE BATTERY IS FULLY CHARGED THE LIGHT TURNS GREEN.

ICI DOES NOT RECOMMEND CHARGING THE DEVICE WHILE IT IS ON A TRIPOD. LAY DEVICE FACE DOWN ON A FLAT AND STABLE DESK OR TABLE WHILE CHARGING.

ENSURE THE IMAGER IS NEAR ROOM TEMPERATURE BEFORE CHARGING THE DEVICE. DO NOT CHARGE IN EXTREMELY HOT OR COLD AREAS. THE BATTERY CAPACITY MAY BE DECREASED IF CHARGED IN AN EXTREME TEMPERATURE ENVIRONMENT.

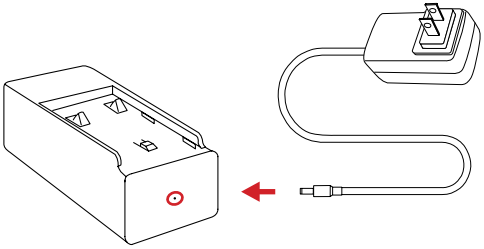
IF YOU DO NOT USE THE IMAGER FOR A LONG PERIOD OF TIME, PUT THE DEVICE IN A COOL AND DRY ENVIRONMENT. THE BATTERY WILL DISCHARGE OVER TIME; THEREFORE, THE IMAGER SHOULD BE CHARGED OCCASIONALLY TO PREVENT DAMAGE TO THE BATTERY OR THE DEVICE.

7-5 Charging Instructions: Option 2

REMOVE THE BATTERIES FROM THE DEVICE TO FOLLOW CHARGING METHOD.

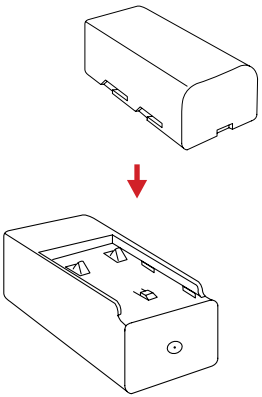
A.

Plug the power adapter into the battery charger.



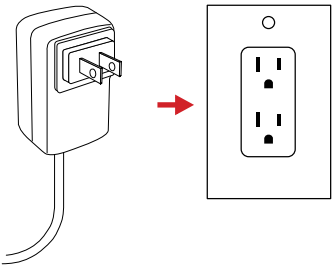
B.

Insert batteries into battery charger.



D.

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



WHEN THE BATTERY IS NOT PLACED IN THE CHARGER THE INDICATOR LIGHT DOES NOT FLASH. THE LIGHT TURNS RED WHEN THE BATTERY IS PLACED AND CHARGING. WHEN THE BATTERY IS FULLY CHARGED THE LIGHT TURNS GREEN.

8. Operation Instructions

8-1 How to Charge the Battery

Before using the imager for the first time, charge the battery for a minimum of 5 hours. The battery status is shown by the indicator in the upper-right corner of the screen.

8-1-1 Charging via Battery Charger

1. Plug the jack end of the power adapter into the battery charger.
2. Align the battery and insert the battery into the battery charger.
3. Plug the power adapter into a 110v/120V electrical outlet.

8-1-2 Charging via Power Adapter

1. Plug the jack end of the power adapter into the Corona Camera.
2. Plug the power adapter into a 110v/120V electrical outlet.

ENSURE THE IMAGER IS NEAR ROOM TEMPERATURE BEFORE CHARGING THE DEVICE. DO NOT CHARGE IN EXTREMELY HOT OR COLD AREAS. THE BATTERY CAPACITY MAY BE DECREASED IF CHARGED IN AN EXTREME TEMPERATURE ENVIRONMENT.

8-2 Power On/Off the Device

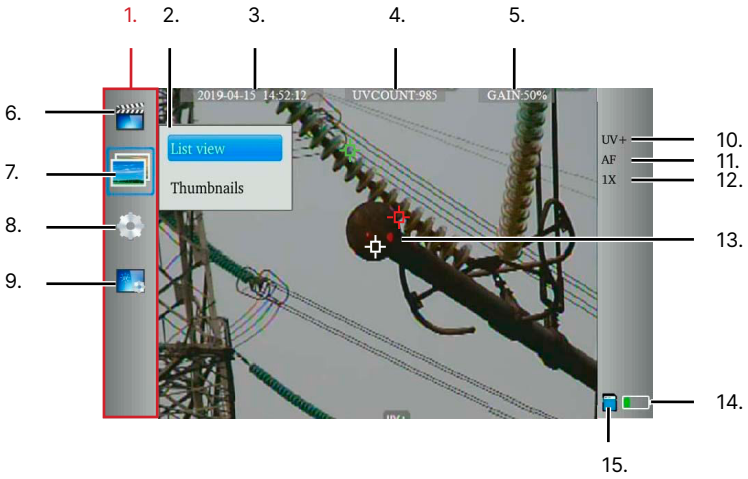
To turn the camera on, push and hold the Power button for two seconds. Please wait patiently as it can take up to a minute for the heads up display to load.

Repeat and hold for more than 3 seconds to power off the device.

IT CAN TAKE SEVERAL MINUTES FOR THE HEADS UP DISPLAY TO LOAD. WAIT PATIENTLY FOR THE HEADS UP DISPLAY TO COMPLETELY LOAD BEFORE ATTEMPTING TO IMAGE CORONAL DISCHARGE.

8-3 User Interface

The device interface appearance:



1. Main Menu
2. Submenu
3. Date and Time
4. UV Count
5. Gain Value
6. Video Gallery
7. Image Gallery
8. Settings
9. Image Settings
10. Display Mode
11. Focus Mode
12. Zoom
13. Discharge
14. Battery Life
15. Memory Card

8-4 Access the Main Menu

Users can access the Main Menu by pressing the OK button. Press the Back button to exit the Main Menu.

8-5 Zoom

Press the [+] button to zoom in on a target. Press the [-] button to zoom out.

8-6 Media Management

8-6-1 Capture an Image

Images are captured and stored in the JPG format and videos in the AVI format.

1. Find and aim the device at the target.
2. Adjust the focus till the image is clear.
3. Press the capture button to take a photo.

8-6-2 Capture a Video

Videos are recorded and stored in the AVI format.

1. Find and aim the device at the target.
2. Adjust the focus till the image is clear.
3. Press the record button to begin recording.
4. Press the record button to end recording.

8-6-3 Review Images

When an image is captured it will be stored to the memory card. Image files are also named and sorted by the recording time .

Media can be viewed at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Image Gallery.
3. Press OK to open gallery submenu.
4. Use the Navigation buttons to select layout.
5. Press OK to open enter the library.
6. Use the Navigation buttons to select an image.
7. Press OK to open the submenu.
8. Use the Navigation buttons to select Open.
9. Press OK to view image in full screen mode. Use the Navigation buttons to cycle left or right between gallery images. Press the Mode button to zoom in; then, use the Navigation buttons to pan across the image.
10. Press the Back button repeatedly to exit the gallery.

8-6-4 Delete Images

When an image is captured it will be stored to the memory card. Media can be deleted at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Image Gallery.
3. Press OK to open gallery submenu.
4. Use the Navigation buttons to select layout.
5. Press OK to open enter the library.
6. Use the Navigation buttons to select an image.
7. Press OK to open the submenu.
8. Use the Navigation buttons to select Delete.
9. Press OK.
10. Use the Navigation buttons to select OK to confirm deletion or select Cancel to cancel deletion; then, press OK to confirm selection.
11. Press the Back button repeatedly to exit the gallery.

DELETED IMAGES CANNOT BE RECOVERED.

8-6-5 Image Information

When an image is captured it will be stored to the memory card. Media information can be viewed at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Image Gallery.
3. Press OK to open gallery submenu.
4. Use the Navigation buttons to select layout.
5. Press OK to open enter the library.
6. Use the Navigation buttons to select an image.
7. Press OK to open the submenu.
8. Use the Navigation buttons to select Details.
9. Press OK. Information is displayed.
10. Press the Back button repeatedly to exit the gallery.

8-6-6 Playing Videos

When a video is captured it will be stored to the memory card. Video files are named and sorted by their recording time.

Media can be viewed and played at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Video Gallery.
3. Press OK to open gallery video list.
4. Use the Navigation buttons to select a video.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Open.
7. Press OK to view video in full screen mode. Video auto-plays. Press OK to pause or play the video. Use the right and left Navigation buttons to scroll through the timeline.
8. Press the Back button repeatedly to exit the gallery.

8-6-7 Delete Videos

When a video is captured it will be stored to the memory card. Media can be deleted at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Video Gallery.
3. Press OK to open gallery video list.
4. Use the Navigation buttons to select a video.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Delete.
7. Use the Navigation buttons to select OK to confirm deletion or select Cancel to cancel deletion; then, press OK to confirm selection.
8. Press the Back button repeatedly to exit the gallery.

DELETED VIDEOS CANNOT BE RECOVERED.

8-6-8 Transferring Media to an External Device

8-6-8-1 MicroSD Card

The easiest way to move images from the device is to remove the memory card from the device and insert it into a proper computer port or adapter. Follow your company's procedures for moving images and video files between devices.

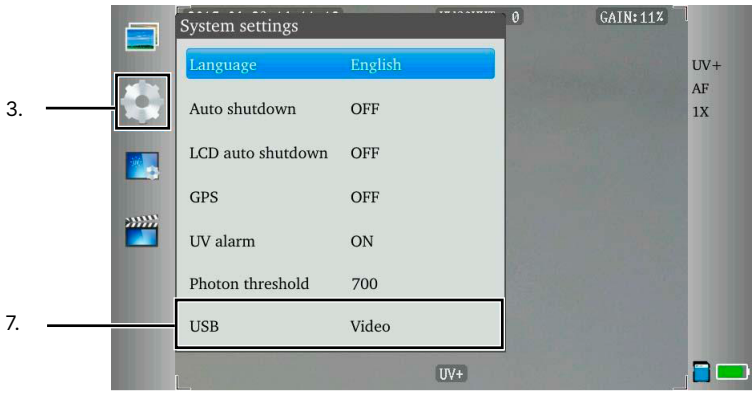
8-6-8-2 USB Mode

8-6-8-2-1 File Transmission

When the USB Mode is set to File Transmission a computer can directly access the SD card while it is still in the device through an attached USB cable.

Transfer files using USB Mode as follows:

1. Connect to the device to a computer using the USB cable.
2. Press OK to access the Main Menu.
3. Use the Navigation buttons to select the System Settings
4. Press OK to open the submenu.
5. Use the Navigation buttons to select System Settings.
6. Press OK to open the submenu.
7. Use the Navigation buttons to select USB.
8. Press OK to open the drop-down menu.
9. Use the Navigation buttons to select File Transmission.
10. Press OK to confirm selection. Press Back to Cancel selection.
11. Press the Back button repeatedly to exit the menu.



8-6-8-2-2 Video Transmission

Stream video to an external monitor as follows:

1. Connect to the device to a computer using the USB cable.
2. Power on the device.
3. Press OK to access the Main Menu.
4. Use the Navigation buttons to select the System Settings
5. Press OK to open the submenu.
6. Use the Navigation buttons to select System Settings.
7. Press OK to open the submenu.
8. Use the Navigation buttons to select USB.
9. Press OK to open the drop-down menu.
10. Use the Navigation buttons to select Video.
11. Press OK to confirm selection. Press Back to Cancel selection.
12. Press the Back button repeatedly to exit the menu.

THE USER MAY NEED TO RESTART THE DEVICE AFTER CHANGING BETWEEN USB MODES.

8-6-9 Image Information

When a video is captured it will be stored to the memory card. Media information can be viewed at any time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the Video Gallery.
3. Press OK to open gallery video list.
4. Use the Navigation buttons to select a video.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Details.
7. Press OK. Information is displayed.
8. Press the Back button repeatedly to exit the gallery.

8-7 Image Mode

There are 3 image modes available:

1. UV: ultraviolet image
2. UV+: ultraviolet image overlay over the visible image
3. Visible: digital image only

8-7-1 Change Image mode

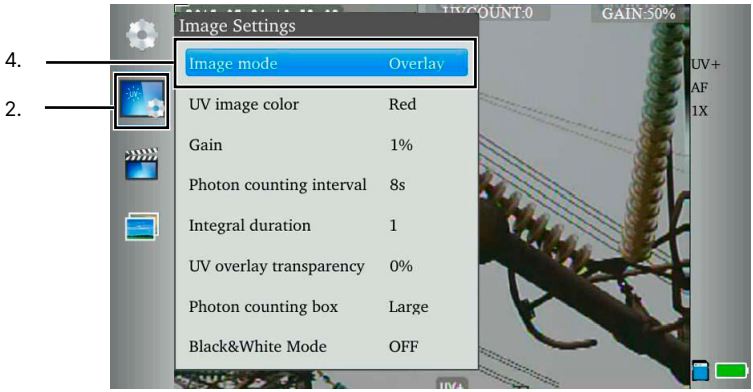
There are two ways to change the image.

8-7-1-1 Mode Button

Press the Mode button to change the image mode.

8-7-1-2 Mode Menu

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Image Mode.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select the preferred mode.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

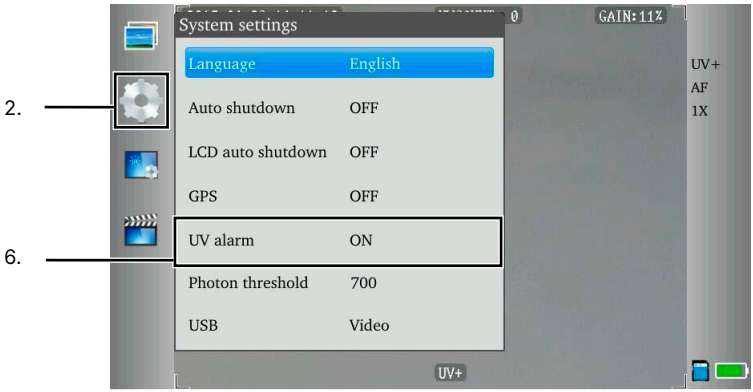


8-8 UV Alarm Settings

8-8-1 Enable Alarms

By default the imager alarm thresholds are disabled. Enable alarms as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the System Settings
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select UV Alarm.
7. Press OK to open the drop-down menu.
8. Use the Navigation buttons to select the preferred option. Select On to enable. Select Off to disable.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.



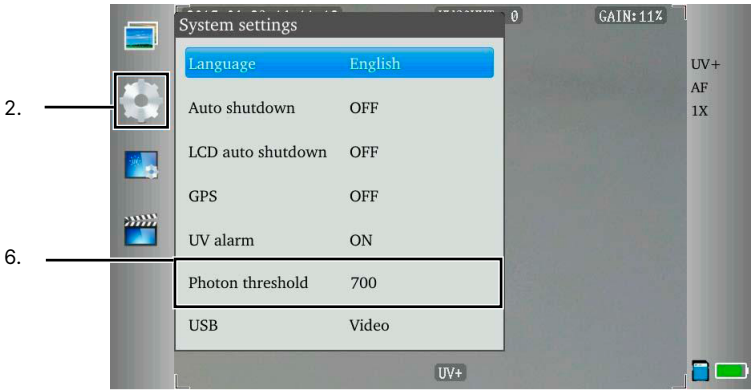
ADJUST THE ALARM THRESHOLD TO HELP REFINE UV DETECTION. WHEN AN ALARM THRESHOLD IS EXCEEDED AN AUDIBLE ALARM SOUNDS.

8-8-2 Alarm Threshold

The alarm threshold helps users refine UV detection. When an alarm thresholds are exceeded an audible alarm sounds.

Adjust the alarm threshold as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select the System Settings
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Photon Threshold.
7. Press OK to open the rotary menu.
8. Use the Navigation buttons to select the preferred value.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.



8-8-3 Audible Alarm

By default the imager alarm is disabled. When enabled, users may adjust the threshold level for alarm triggers. When an alarm threshold is exceeded an audible alarm sounds. The volume is not currently adjustable.

8-9 Image Settings

The image settings are mainly used to configure the display effects, sensitivity, and collected data.

8-9-1 UV Image Color

Users can change the overlay color of detected discharges as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select UV Image Color.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select the preferred color: red, blue, white, purple, or green.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

8-9-2 Gain Sensitivity

Users can adjust the sensitivity of the detector by adjusting the gain. The value ranges from 0% to 100%. Increase the gain slowly to detect minimum levels of discharge. A high gain can enhance interference signals which are usually random and do not have a fixed location.

A high gain can cause the discharge effect to become an oversized spot and it may block the visible image. Therefore, ICI recommends the use of high gain only during the initial detection; slowly reduce the gain to pinpoint the location of the discharge source.

Adjust the gain as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Gain
5. Press OK to open the submenu.
6. Use the Navigation buttons to select the preferred percentage: 0% to 100%.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

8-9-3 Photon Counting Interval

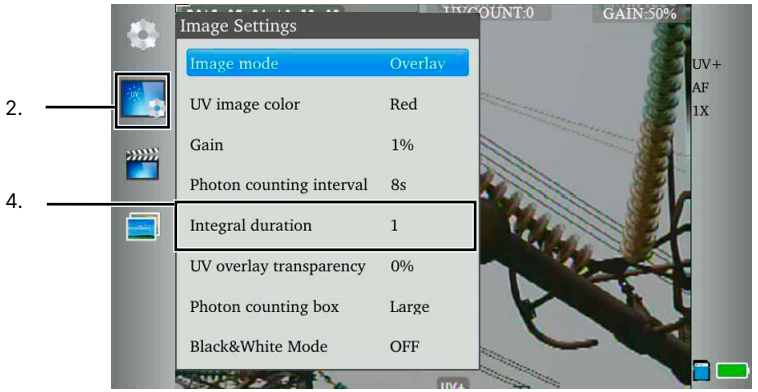
Users can adjust the counting interval as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Photon Counting Interval.
5. Press OK to open the rotary menu.
6. Use the up or down Navigation buttons to select the preferred time: 1 to 10 seconds.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

8-9-4 Integral Duration

Adjust the integral duration as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Integral Duration.
5. Press OK to open the drop-down menu.
6. Use the up or down Navigation buttons to select the preferred value: 1, 2, 4, 8, 16, or 32.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.



8-9-5 UV Overlay Transparency

Users can set the transparency of UV images as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select UV Overlay Transparency.
5. Press OK to open the rotary menu.
6. Use the up or down Navigation buttons to select the preferred value: 0%, 25%, 50%, or 100%.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

8-9-6 Photon Counting Box

The photon counting box is used to set the detection area of the image display window. The large window option is full screen and allows every pixel to be used for detection analysis. Medium and small windows take up narrower areas to help users focus detection on a limited area which may help users block out non-essential areas.

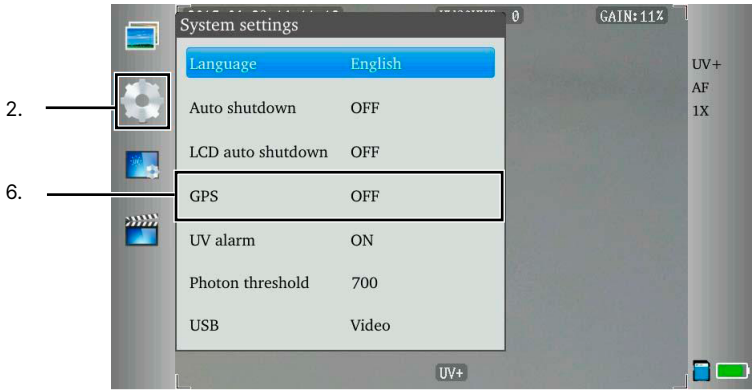
Users can adjust the photon counting box as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Photon Counting Box.
5. Press OK to open the drop-down menu.
6. Use the up or down Navigation buttons to select the preferred value: Large, Medium, or Small. The detection area is marked in green.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

8-10 GPS

Enable the GPS to tag media as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select GPS.
7. Press OK to open the drop-down menu.
8. Use the Navigation buttons to select the preferred option. Select On to enable. Select Off to disable.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.



LEAVE THE GPS DISABLED WHEN NOT USING GEOLOCATION AS ENABLING THE FEATURE USES MORE POWER AND DEPLETES THE BATTERY AT A FASTER RATE.

8-11 System Settings

8-11-1 Date and Time Settings

8-11-1-1 Change the Date

The date format is YYYY/MM/DD. Change the date as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Time Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Date.
7. Press OK to open the rotary menu.
8. Use the right and left Navigation buttons to select the preferred place holder. Use the up and down Navigation buttons to select the date.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

8-11-1-2 Change the Time

The time format is HH:MM. Change the date settings as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Time Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Time.
7. Press OK to open the rotary menu.
8. Use the right and left Navigation buttons to select the preferred place holder. Use the up and down Navigation buttons to select the time.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

PERFORM A FACTORY RESET TO RESTORE DEFAULT SETTINGS.

8-11-2 Language Settings

The default language is English. Change the language as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Language Settings.
7. Press OK to open the drop-down.
8. Use the Navigation buttons to select Language: Simplified Chinese, Chinese, English, Japanese, Korean, German, French, Russian, Italian, Portuguese, or Spanish.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

8-11-3 Display Brightness Settings

Brightness settings cannot be changed; however, users can use the sun cover to help see in bright areas. Users may also switch to Black & White mode to help with visibility in dark environments.

8-11-3-1 Black & White Mode

Users can switch the device into black and white mode for better viewing in dark environments. Change into black and white mode as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select Image Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Black & White Mode.
5. Press OK to open the drop-down menu.
6. Use the Navigation buttons to select the preferred option. Select On to enable. Select Off to disable.
7. Press OK to confirm selection. Press Back to Cancel selection.
8. Press the Back button repeatedly to exit the menu.

PERFORM A FACTORY RESET TO RESTORE DEFAULT SETTINGS.

8-11-4 Power management Settings

8-11-4-1 Automatic Shutdown

To save power users can change the auto shut off settings. Change power management settings as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Auto Shutdown.
7. Press OK to open the drop-down.
8. Use the Navigation buttons to select preferred shutdown time: 10 minutes, 20 minutes, or 30 minutes. Off disables the automatic shutdown.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

8-11-4-2 Sleep Mode

To save power users can change the sleep mode settings. Change power management settings as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select Time to Sleep Mode.
7. Press OK to open the drop-down.
8. Use the Navigation buttons to select preferred shutdown time: 10 minutes, 30 minutes, or 60 minutes. Off disables the sleep mode.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

8-11-5 File Name Display

Users can change the amount of time the file saving notification displays on screen. Adjust the amount of time as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Settings.
5. Press OK to open the submenu.
6. Use the Navigation buttons to select File Name Display.
7. Press OK to open the rotary menu.
8. Use the Navigation buttons to select preferred value.
9. Press OK to confirm selection. Press Back to Cancel selection.
10. Press the Back button repeatedly to exit the menu.

8-11-6 Video Format

Change the video format as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Display Settings.
5. Press OK to open the Display Settings.
6. Press OK to open the drop-down menu.
7. Use the Navigation buttons to select the format type: NTSC or Pal.
8. Press OK to confirm selection. Press Back to Cancel selection.
9. Press the Back button repeatedly to exit the menu.

PERFORM A FACTORY RESET TO RESTORE DEFAULT SETTINGS.

8-11-7 Format the SD Card

Users can format the memory card as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Format.
5. Press OK to open the dialog box.
6. Use the Navigation buttons to select OK to confirm deletion or select Cancel to cancel deletion; then, press OK to confirm selection.
7. Press the Back button repeatedly to exit the menu.

FORMATTING THE MEMORY CARD ERASES ALL MEDIA STORED ON THE MEMORY CARD AND CANNOT BE UNDONE.

8-11-8 Perform a Factory Reset

Restore default settings as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select Factory Defaults.
5. Press OK to open the dialog box.
6. Use the Navigation buttons to select OK to confirm deletion or select Cancel to cancel deletion; then, press OK to confirm selection. Screen flashes black once when refresh is complete.
7. Press the Back button to exit the menu.

PERFORMING A FACTORY RESET WILL NOT FORMAT THE MEMORY CARD HOWEVER USERS MAY WISH TO REMOVE THE MEMORY CARD BEFORE ATTEMPTING A FACTORY RESET OF THE DEVICE.

PERFORMING A FACTORY RESET ERASES CUSTOMIZED USER CONFIGURATIONS STORED ON THE DEVICE AND RESTORES THE ORIGINAL DEFAULT SETTINGS PROGRAMMED BY THE MANUFACTURER. THE PROCESS CANNOT BE UNDONE.

8-11-9 Memory Card Information

Users can view memory card information as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select SD Card Info.
5. Press OK to open the dialog box.
6. Press the Back button repeatedly to exit the menu.

8-11-10 System Information

Users can view device information as follows:

1. Press OK to access the Main Menu.
2. Use the Navigation buttons to select System Settings.
3. Press OK to open the submenu.
4. Use the Navigation buttons to select System Info.
5. Press OK to open the dialog box.
6. Press the Back button repeatedly to exit the menu.

9. Fundamentals of Corona Discharge

9-1 What is Corona?

Corona discharges in the high electric field region of an insulator are linked to an ionization process involving the continual transfer of electrons being knocked from orbit and recaptured. This phenomenon releases energy in the form of photons, which manifests as a glow commonly observed on some power infrastructure during low light conditions. Interestingly, this glow can also be detected during daytime using a solar blind UV camera.

The ionization process is initiated by a high local electric field, which causes the excitation of Nitrogen molecules and leads to the emission of UV radiation. This UV radiation falls within the range of 230 nm to 405 nm.

As the ionization process progresses, ionized Nitrogen reacts with other components in the air, forming corrosive nitric acid and ozone. This buildup of ionization becomes problematic when an electron gains enough speed to exceed a critical value, resulting in increased coronal activity. Consequently, the buildup of corrosive substances can lead to the corrosion of wires and insulators in power infrastructure.

Understanding the mechanisms behind corona discharges and their effects is essential for the maintenance and longevity of power systems. The ability to detect and monitor UV radiation emissions, as achieved with ICI's Corona Camera, offers valuable insights into these processes, even during daylight hours. By managing and mitigating the ionization-induced corrosive effects, the reliability and safety of power infrastructure can be significantly enhanced.

9-2 Where does Corona Occur?

Corona devices play a crucial role in detecting corona, partial discharge, and arching in electric grid components. Various factors can lead to corona, such as the degradation of polymer insulators, corrosion, physical damage to components, broken strands, loose hardware, and faulty ground connections. Additionally, environmental factors like pollution, dust, or dirt accumulation on the insulators can contribute to corona occurrences.

The locations where corona most commonly appears are on points, along sharp edges, and inside cavities. Detecting corona in these areas is essential for maintaining the integrity and reliability of the electric grid and preventing potential issues that may arise from the phenomenon. With the help of corona devices, these problem areas can be identified and addressed promptly, ensuring the smooth operation of the power infrastructure.

9-3 Benefits of Corona Inspections

Infrared cameras may miss certain electrical issues due to solar loading when objects or surfaces being examined absorb heat, resulting in an increase in temperature and an obstruction or distortion of thermal readings. For this reason, infrared cameras face limitations during the day and inspections are best performed in the evening.

By contrast, inspections with corona cameras can be conducted during the day thanks to solar filters that block naturally occurring solar energy, preventing solar loading and ensuring accurate, reliable results. This eliminates the need to wait until evening for inspections, resulting in increased efficiency and faster identification of potential issues.

Both infrared and corona cameras are useful in electrical inspections and business may benefit from regular daylight corona inspections followed by evening infrared inspections as some equipment may run hot without producing coronal discharge or arching.

10. Cleaning and Maintenance

10-1 Cleaning the Lens

Do not use corrosive chemicals on the optical glass components. Dust, grease, and fingerprints may 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 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.

10-2 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.

10-3 Device Maintenance

It is recommended to have the device(s) checked annually for wear or degrading parts. Contact customer service to schedule maintenance.

10-4 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.

CONTACT CUSTOMER SERVICE TO SCHEDULE MAINTENANCE.

11. Troubleshooting

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.

11-1 The imager does not power on

- Ensure battery is installed
- Replace old battery
- Charge battery

11-2 The imager shuts off unexpectedly

- Replace old battery
- Charge battery

11-3 No UV image

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

11-4 Unclear or dark visible images

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

11-5 UV readings are incorrect

- Turn off the device; then, turn it back on
- Device is at proper height
- Ensure device is in focus
- Adjust photon sensitivity

11-6 Camera out of focus

- Adjust focus ring

11-7 Memory card error

- Insert memory card

11-8 Alarm not sounding

- Turn off the device; then, turn it back on
- Enable alarms
- Adjust alarm threshold

12. About ICI

ICI manufactures complete systems and software. We can provide complete engineering, software, and OEM solutions. Our Fortune 500 clients rely on us for 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 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. Additionally, our ICI 7320 was awarded “Product of the Month” by NASA*. Originally named Texas Infrared (still DBA), Infrared Cameras, Inc. has been in business since March, 1995.

Thank you for your dedicated and continued support.

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