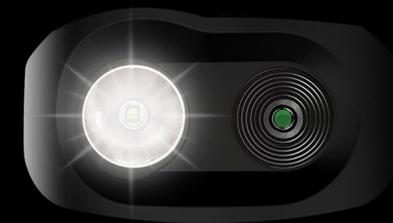


# Seek<sup>™</sup> *Reveal*<sup>™</sup> SERIES USER GUIDE



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# ATTRIBUTIONS



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Seek Thermal reserves the right to change or improve its products and make changes to the content of this manual without obligation to notify any person or organization of such changes or improvements. It is the user's responsibility to go to [www.thermal.com](http://www.thermal.com) for current updates, firmware upgrades, and supplemental information concerning the use of this product. To view product specific support, visit [thermal.com/revealsupport](http://thermal.com/revealsupport).

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# INTRODUCTION



Built for the realities of work and play, the Seek Reveal handheld advanced thermal imaging camera combines thermography insight and a high-performance 300 Lumen LED light in one durable device. With a detectable temperature range of  $-40^{\circ}$  to  $626^{\circ}\text{F}$  ( $-40^{\circ}$  to  $330^{\circ}\text{C}$ ), Reveal lets you pinpoint and measure specific sources of heat—and heat loss—up to 500 feet away, at just the touch of a button.

Whether you're a plumber searching for a clog, an electrician checking for a hotspot, a homeowner looking for peace of mind, or a hunter retrieving or finding game, Seek Reveal delivers the thermal insight and illumination you need to find, fix, and feel safe faster.

- **See more, and know more—from the palm of your hand.** With its ergonomic grip and angled display, Reveal lets you focus on what's in front of you—without losing clear sight of what's around you.
- **State-of-the-art technology, tough enough for the toolbox.** Life can get pretty dirty, so Seek Reveal can, too. You can count on its rugged, rubberized casing and intuitive controls to go and work where you do—no matter what conditions you face.
- **See through the dark. Light optional.** Reveal's advanced infrared technology lets you see thermal images even in the darkest night. This device does not rely on any ambient light for viewability. And when you need it, Reveal's powerful 300-lumen LED light makes sure you know exactly what's out there.
- **Use Reveal to your advantage.** Reveal's customizable settings let you choose from dozens of preferences, including image settings, light levels, power usage, and more.
- **Store, transfer, and share your images: Reveal makes it simple.** Reveal's integrated USB connectivity allows you to quickly and easily transfer the thermal images you capture directly to your computer. Keep a record of your discoveries—and share them with the world.



# INTRODUCTION

## **WARNING**

*It is your responsibility to use your Seek Reveal device in a safe manner. Seek Thermal, Inc. will not be responsible for any property damage, injuries, or deaths resulting from any use of this device in any activities.*

*This product contains a rechargeable polymer lithium-ion battery. To prevent the possibility of personal injury or product damage caused by battery exposure to extreme heat, store the device out of direct sunlight and away from other extreme heat sources. Dispose of battery and device in a proper manner.*

## **Notice**

---

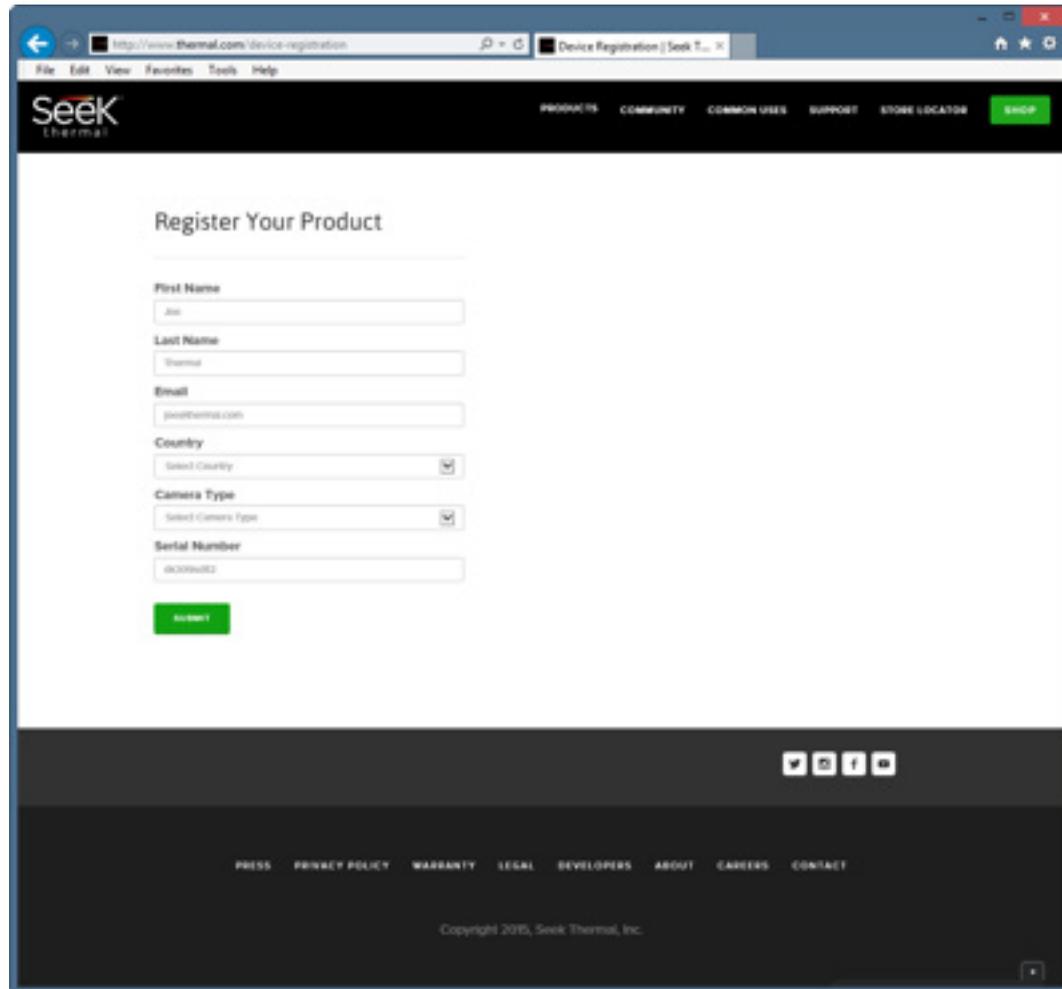
To prevent corrosion, thoroughly clean and dry the contacts of the microUSB cable and the surrounding area at the rear door of the device before charging or connecting the cable to your Seek Reveal, the charging adapter, or your computer. Please refer to the cleaning instructions in the Care Guide below.

# INTRODUCTION

## **Feedback**

We have tested and verified the information in this manual to the best of our abilities. We are committed to the ongoing improvement and development of our products, so you may find features of your Reveal have been changed and/or updated since the time of printing. We will continually update the document as needed and adjust the date of printing and version. Please ensure you have the latest version of this document by visiting our website at [support.thermal.com](https://support.thermal.com). And if you have any product suggestions or find any errors, we want to hear them: contact us anytime at [support@thermal.com](mailto:support@thermal.com).

# PRODUCT REGISTRATION



The screenshot shows a web browser window with the URL <http://www.thermal.com/device-registration>. The page title is "Device Registration | Seek Thermal". The main content area is titled "Register Your Product" and contains a form with the following fields:

- First Name:
- Last Name:
- Email:
- Country:
- Camera Type:
- Serial Number:

A green "Submit" button is located below the form. The footer of the page includes social media icons for Twitter, YouTube, Facebook, and Instagram, and a copyright notice: "Copyright 2016, Seek Thermal, Inc."

Figure 1: The Registration page

The key to unlocking your product benefits begins with Registration. Registration is quick and easy – and provides the following benefits:

- Get the most out of your warranty and receive product support alerts.
- Registering your product with Seek Thermal within the first 90 days from purchase receipt will make it eligible for an automatic 1 additional year of Extended Warranty creating a total of 2 years with the same conditions and warranty terms. By Registering, you solidify the extended 1 year on your warranty period and cut down on confusion should you have to take advantage of any warranty services
- Simplified firmware and software upgrades – in a timely manner
- Technical support staff will have up-to-date ownership data - saving you time and making it easier to resolve your issue.
- You can receive important information and quick access to the Seek Community
- First access and sneak peek promotional offers, coupons, and other information
- We seek your input when looking for product feedback, roadmap ideas, and new feature sets.
- *NOTE:* We do not – and will not- sell any consent or contact or personal data to any third-party.

Go to [thermal.com/device-registration](http://thermal.com/device-registration) in your Internet browser to register your Reveal. Once your Reveal is registered, Seek Thermal will send you confirmation of registration.

# QUICK START GUIDE



## Tips and Tricks

1. Fully recharge your device before use with the included (US only) power adapter for optimal performance. For optimal battery performance, charge your Reveal device after prolonged periods of inactive use.
2. While recharging on the charging adapter, shut off thermal imaging to charge more quickly.
3. Menus can be navigated using the Prev / Up or Next / Down buttons. Within some Menu selections, like for example setting a date or time, the Menu buttons will become - and + to adjust a number value.
4. Accessing images via USB is recommended and faster than removal and replacement of the microSD card. The microSD card has a tight fit for purposes of sealing the rubber door to keep moisture out.
5. Be sure to fully close the bottom rubber door over the USB port to keep the product water- and dust-resistant.
6. Individual images can be easily renamed for quick identification once they have been transferred to your PC. All temperature readings stay affixed to the image on storage.
7. Organize your images on your PC by separating them into groups and creating descriptive folders to hold them.
8. Be gentle when inserting the USB cable connectors to prevent damage.
9. Always perform an on-screen eject or dismount on your computer before disconnecting the USB cable to physically ejecting the SD memory card from your computer to prevent corruption of the SD memory card.

Figure 2: Parts definitions and location



# QUICK START GUIDE

## What's in the Box



Figure 3: Reveal Packaging



Figure 4: RevealXR FastFrame Packaging

# QUICK START GUIDE

## Charging the Battery



*Figure 5: Reveal showing the rear door open and the USB port (for charging) highlighted.*

For best (and fastest) results, Seek Thermal recommends charging your Reveal using the included battery charger and cable. Alternatively, the cable can be connected to a USB port on a computer, and your Reveal will charge, albeit more slowly. When the thermal camera is off, the Battery Charging screen will appear.



*Figure 6: Reveal battery charger*

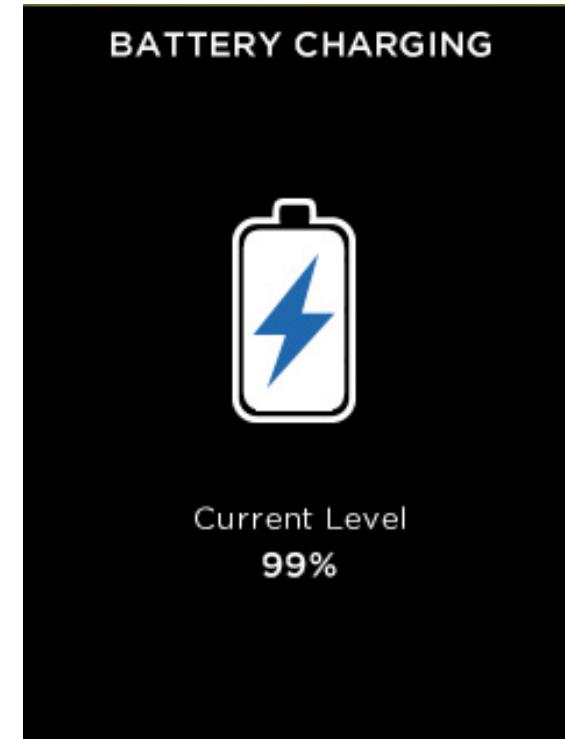


# QUICK START GUIDE

## Charging the Battery



*Figure 7: Supplied cable between charger and Reveal USB Port. Note: Not all OTG cables are built with the same specifications through all suppliers. The cable provided in the BOX is built to our specifications.*

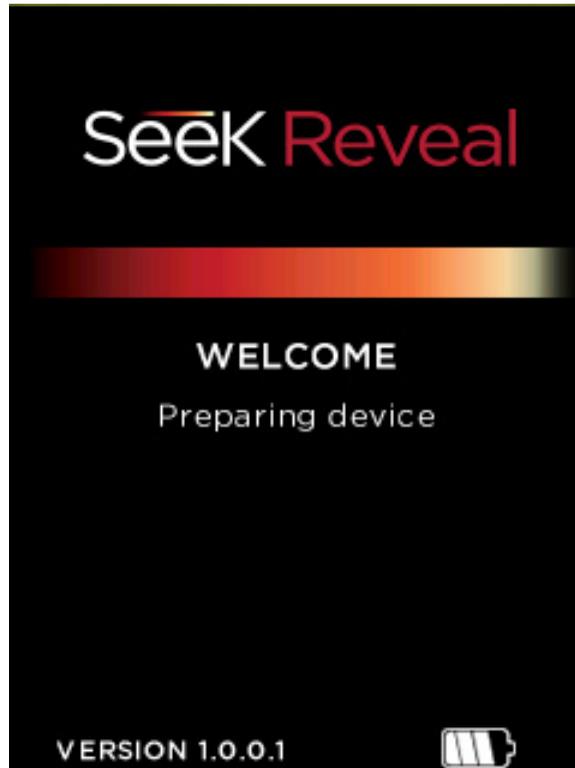


*Figure 8: The Battery Charging screen*



# QUICK START GUIDE

## Turning on your Reveal



*Figure 9: The Splash screen*

A long press of the **CENTER** button  will cause the device to activate and start up the software. The splash screen will then display. Note that the version is also displayed. The startup sequence is shown in Figure 10 on the following page.

# QUICK START GUIDE

## Setting up your Reveal

Press the **CENTER** button to power on the device

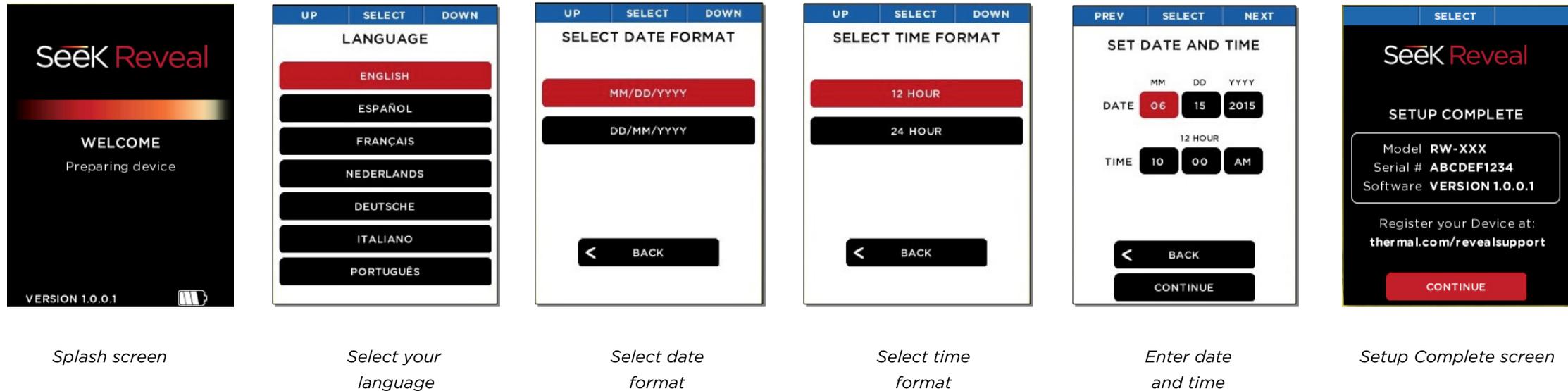
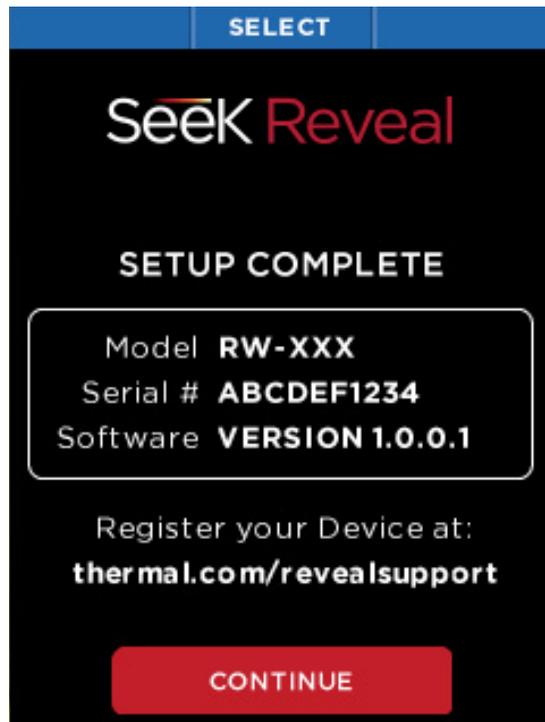


Figure 10: The startup sequence

# QUICK START GUIDE

## Setting up your Reveal



*Figure 11: Setup Complete screen*

When all of the setup screens have been completed, the Setup Complete screen is displayed.

## First-Time Use

**[See Figure 12]** To turn on your device, press the **CENTER** button and hold until the screen lights. The button-function ribbon at the top of the screen defines the meaning of the three buttons. For each of the setup screens, use the **LEFT** and **RIGHT** buttons to navigate, and the **CENTER** button as the selector. For numerical fields, the **LEFT** button subtracts from the displayed value, while the **RIGHT** button adds to it, as the button-function ribbon indicates.



# QUICK START GUIDE

## Thermal Imaging

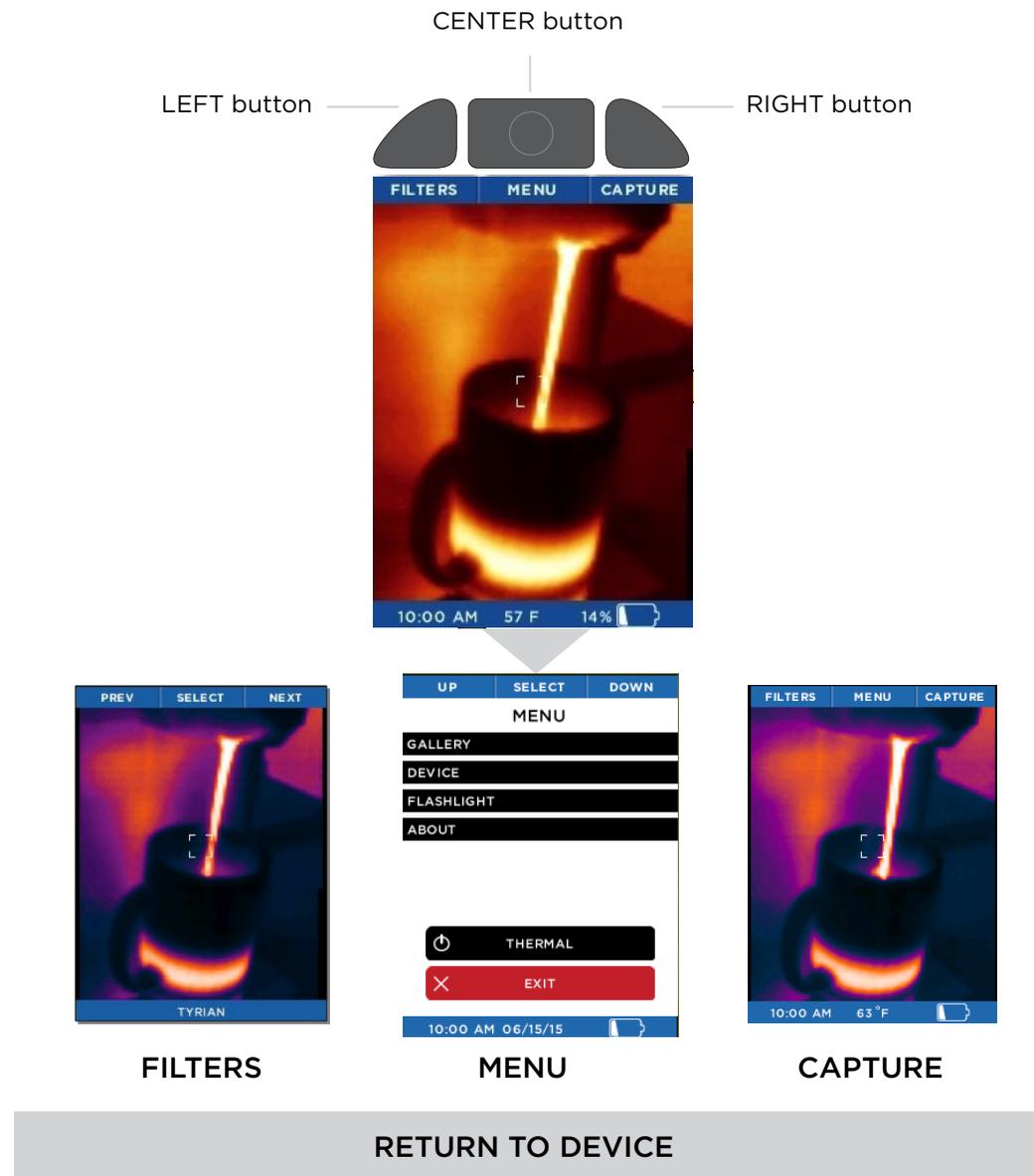


Figure 12: Imaging screen options



# QUICK START GUIDE

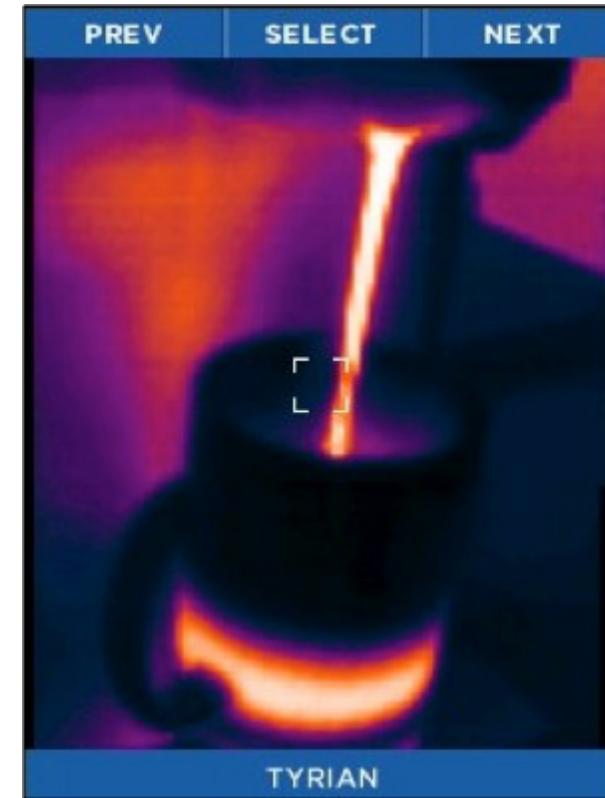
## Filters Screen

On the FILTERS Screen, the button-function ribbon changes to:



*Figure 13: Button-function ribbon on the Filters screen*

By pressing the **LEFT** button for “previous” or the **RIGHT** button for “next”, the image is cycled through the available filters (technically known as look-up tables, or LUTs). The name of the filter currently applied is displayed at the bottom of the image. When you have reached your desired filter, press the **CENTER** button to select and remember the filter. The device then returns to the thermal imaging screen.



*Figure 14: The Filters screen*



# QUICK START GUIDE

## Image Capture Screen

While the thermal imaging screen is displayed, pressing the **RIGHT** button will capture and save an image to the microSD card. You can also enter the **GALLERY** from this screen. The date and time of the captured image are displayed at the bottom (center) of the screen, while the temperature (and units) for the area within the reticle (or target) are displayed just above the reticle.

Every time the **CAPTURE** button is pressed, the image being captured is displayed along with a blue progress bar (left to right) at the bottom of the screen as it is being saved. Holding the **CAPTURE** button down will capture images in rapid succession as fast as they can be saved to the microSD card's memory.

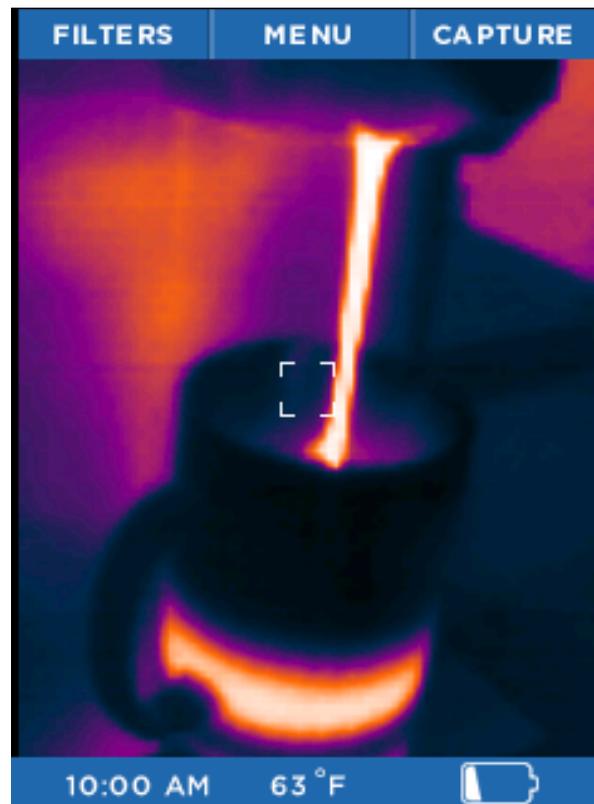
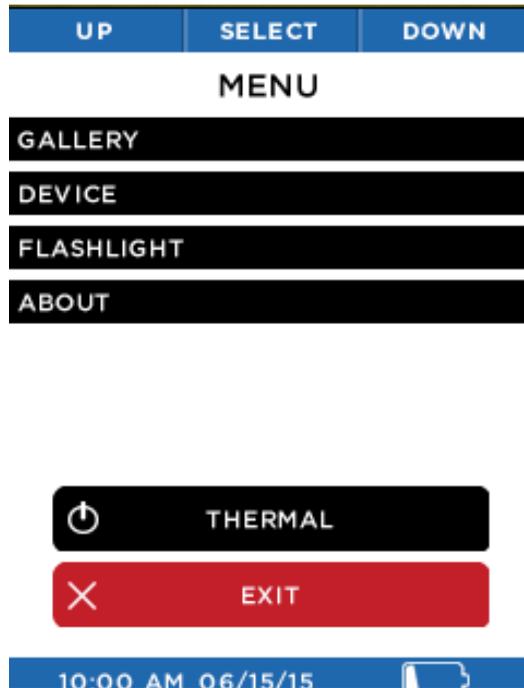


Figure 15: The thermal image capture screen



# QUICK START GUIDE

## Menu Screen



*Figure 16: The Menu screen*

See the following sections for descriptions of the categories of settings found on the Menu screen shown in Figure 16.

# QUICK START GUIDE

## Gallery



*Figure 17: The button-function ribbon on the Gallery screen*

When you enter the Gallery, the most recently captured image is displayed. Pressing the **LEFT** button repeatedly will cycle through all the images in reverse chronological order, while pressing the **RIGHT** button returns you to the oldest chronological image. The date and time of the captured images are displayed at the bottom (center) of the screen, while the temperature (and units) for the area within the reticle (or target) is displayed. Note that the current image number and the total number of images are also displayed at the bottom right. If the Gallery is empty, the empty screen is displayed (see Figure 19).

Pressing the **CENTER** button causes the **OPTIONS** Screen to be displayed. At this point, you can choose to **CANCEL** any operations concerning this image and return to the **GALLERY**, return **BACK TO THERMAL** imaging, or **DELETE** the currently displayed image. The choice is made by using the **LEFT** button for the previous menu item, or the **RIGHT** button for the next menu item, and then the **CENTER** button to make a selection.



# QUICK START GUIDE

## Gallery

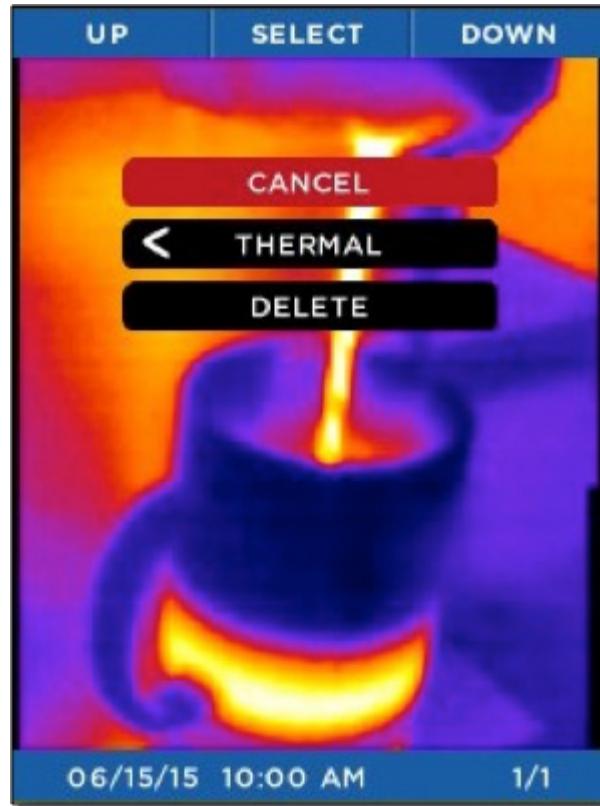


Figure 18: The Gallery OPTIONS screen.



Figure 19: The Empty Gallery screen



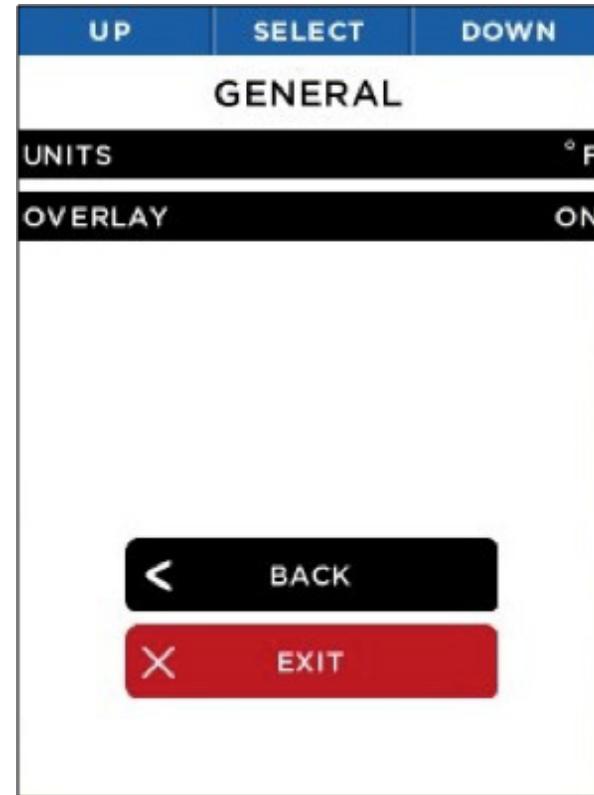
# QUICK START GUIDE

## Device Settings



*Figure 20: The Device Settings screen*

The Device Settings screen allows you to access general camera settings, date and time, language, power, as well as performing a factory restore.



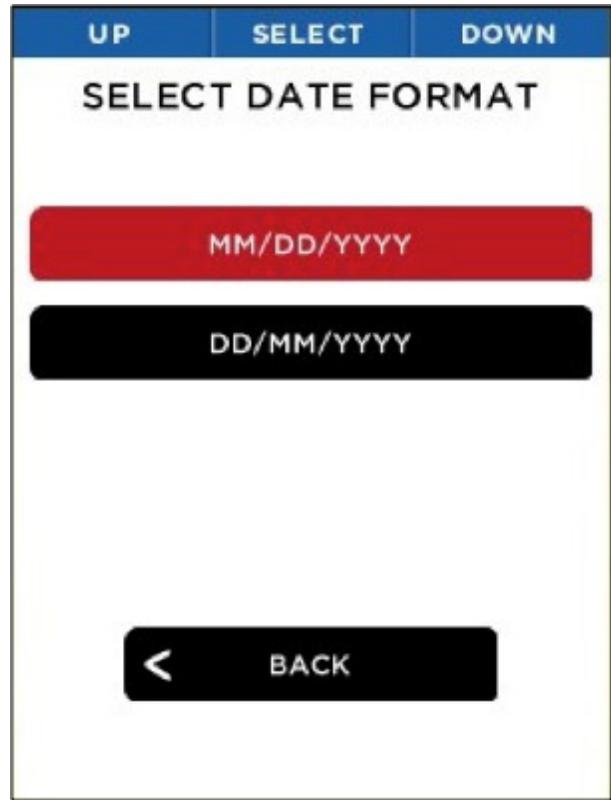
*Figure 21: The General Settings screen*

The General Settings screen allows you to specify the units for displayed temperature, either Celsius or Fahrenheit, and enable or disable the Overlays.



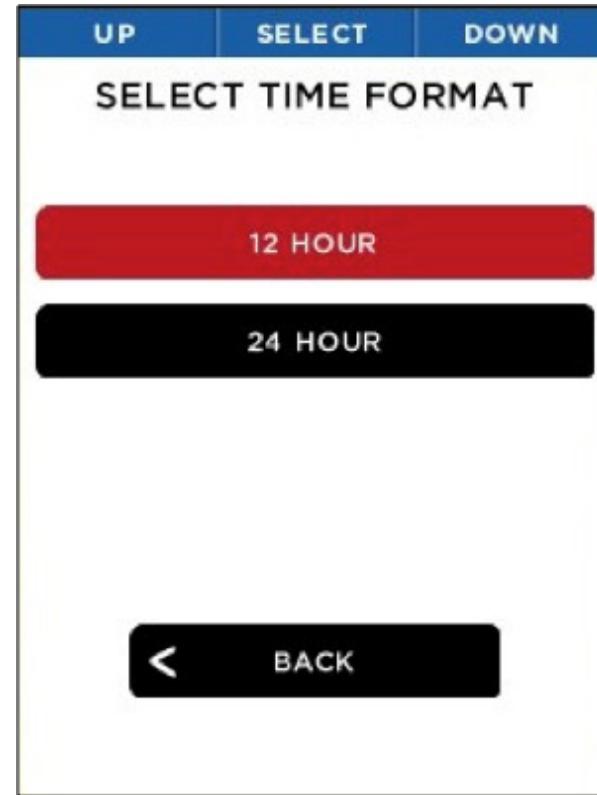
# QUICK START GUIDE

## Device Settings



*Figure 22: Select Date Format screen*

Choosing one of the two date formats causes Reveal to immediately set all date displays and captures to the desired format.

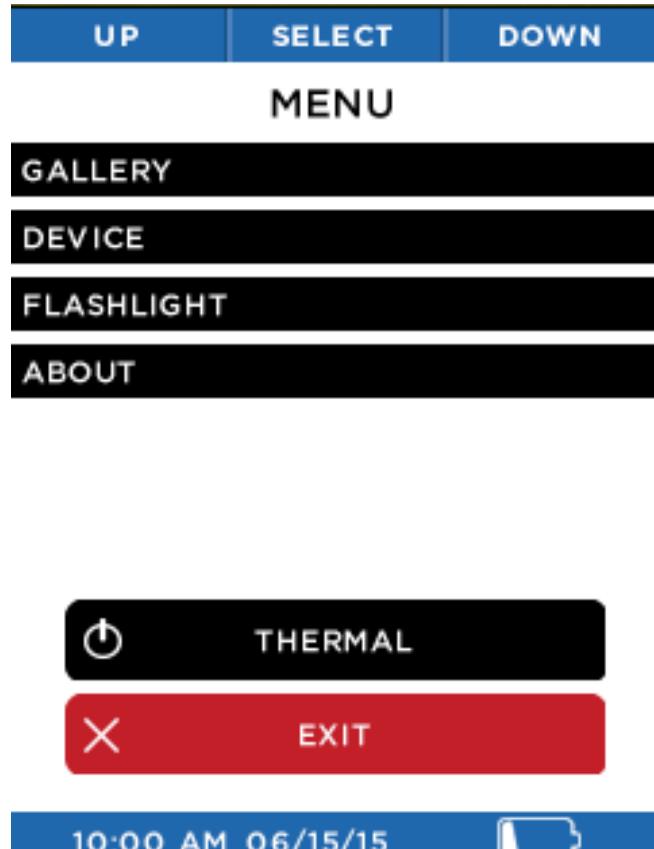


*Figure 23: Select Time Format screen*

Choosing one of the two time formats causes Reveal to immediately set all time displays and captures to the desired format.

# QUICK START GUIDE

## Device Settings



*Figure 24: Set Date and Time screen*

Setting values for the date and time will cause Reveal to update all displays and captures of date and time.

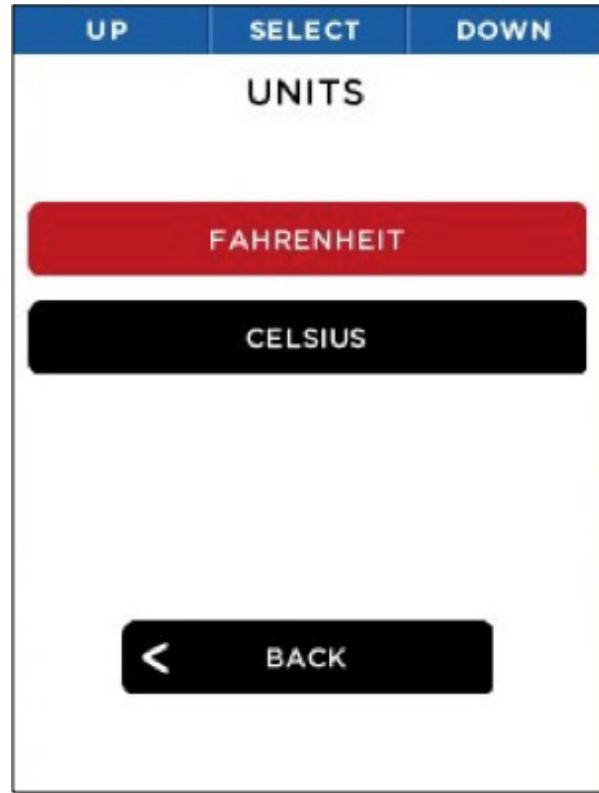


*Figure 25: Language Selection screen*

Choosing a language causes Reveal to immediately set all dialogs to the desired language.

# QUICK START GUIDE

## Temperature Units

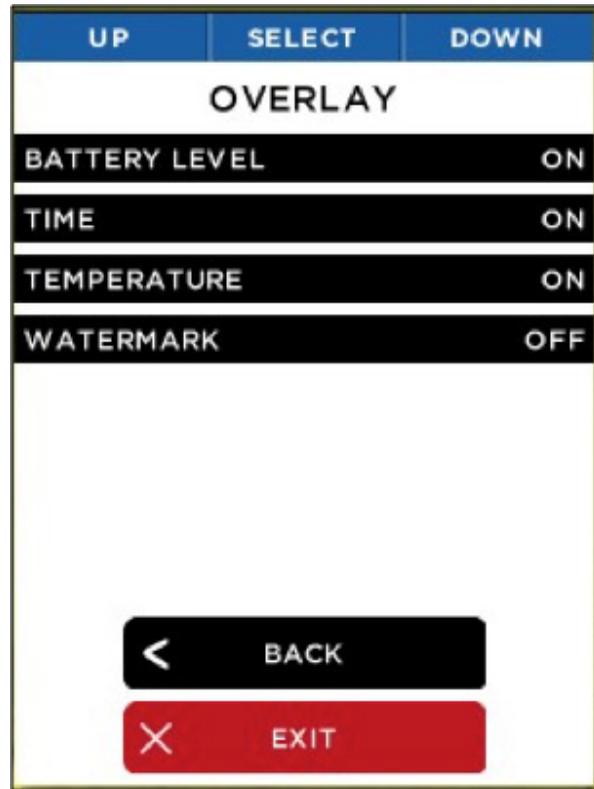


The user can choose to display (and capture) temperatures in one of two available units, Fahrenheit or Celsius.

*Figure 26: The Units screen*

# QUICK START GUIDE

## Overlay Settings



Various overlays are available to enable or disable, including Battery Level, Time, Temperature, and the Seek Watermark.

*Figure 27: The Information Overlay screen*

# QUICK START GUIDE

## Power Settings



*Figure 28: The Power screen*

The Power Settings screen allows you to choose settings for the auto power management or the LCD display screen brightness.



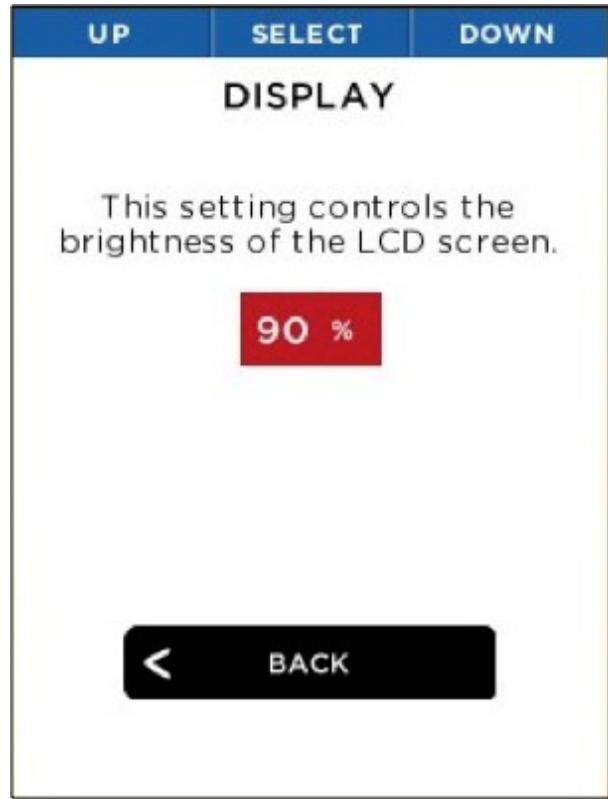
*Figure 29: Auto turn-off setting*

Enabling the Auto Turn-Off setting will automatically turn off the thermal imager after the time specified, as long as there's no further interaction.



# QUICK START GUIDE

## Power Settings



*Figure 30: Display brightness setting*

This setting allows you to control the amount of light generated by the LCD display. Managing this setting allows you to conserve battery power or limit the amount of light from the screen, depending on the situation.



# QUICK START GUIDE

## Flashlight Settings



Figure 31: The Flashlight screen

The Flashlight screen allows you to adjust the intensity level of the two “click” levels of the LED flashlight.

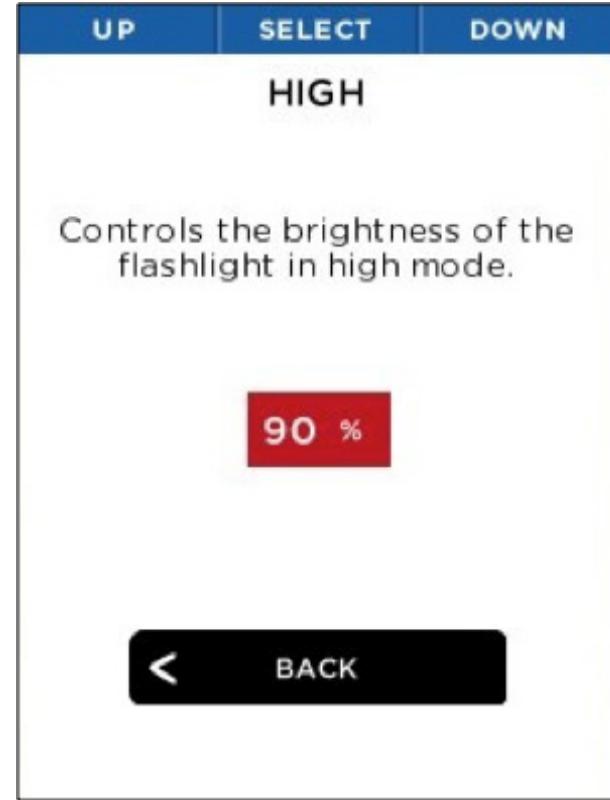


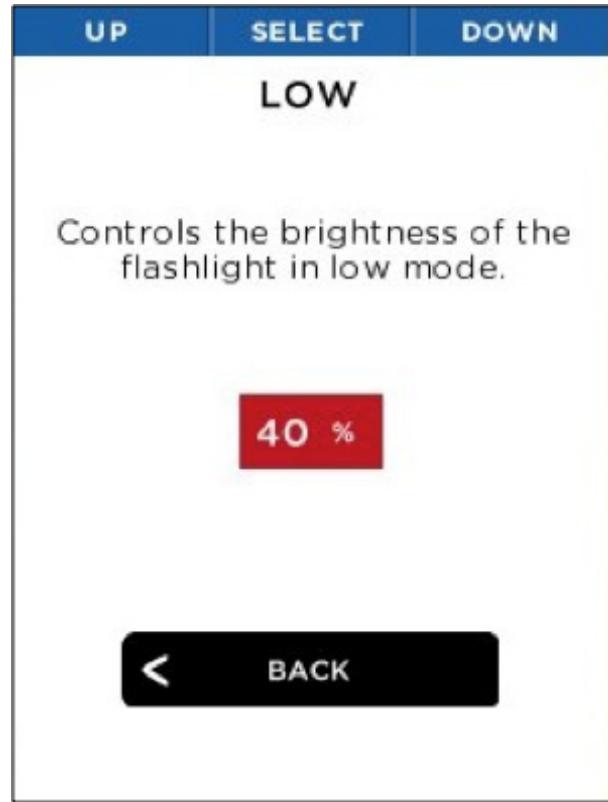
Figure 32: High-intensity setting

You can adjust the flashlight's high-intensity setting, applied with the first button “click”.



# QUICK START GUIDE

## Flashlight Settings



*Figure 33: Low-intensity setting*

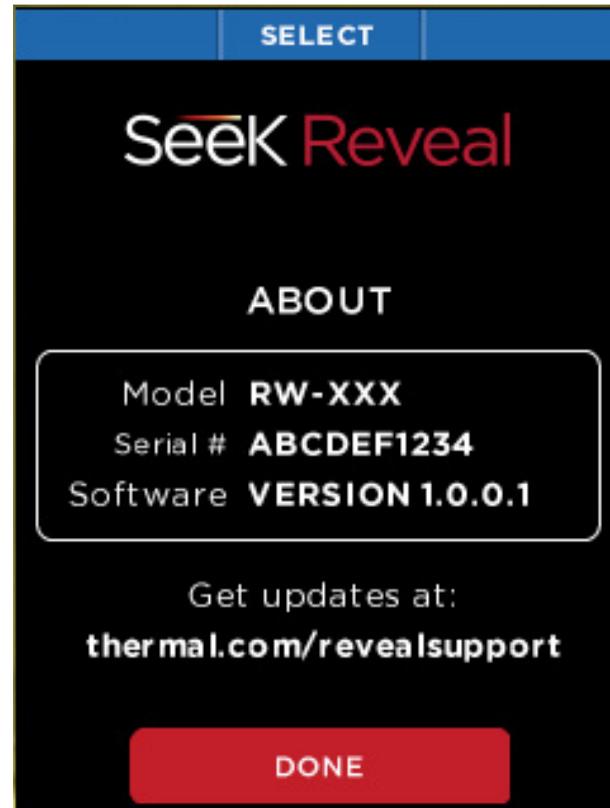
You can also adjust the flashlight's low-intensity setting, applied with the second button "click".



# QUICK START GUIDE

## About

This option displays your Reveal's model number, serial number, and software version.



*Figure 34: The About screen*



# QUICK START GUIDE

## Power Off Thermal

The Power Off Thermal option is an alternative to the long-hold of the **CENTER** button.

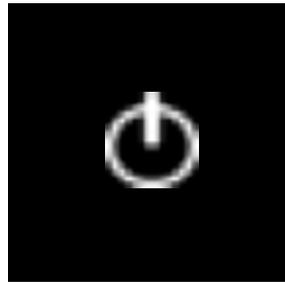


Figure 35: Power off thermal

# QUICK START GUIDE

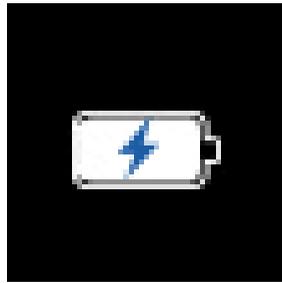
## Battery Iconography

The icons on the Seek Reveal's screen are described in Table 1 below.



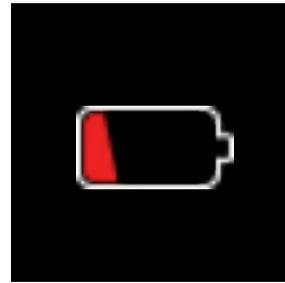
### Power Off

Select this option to turn off the thermal imager.



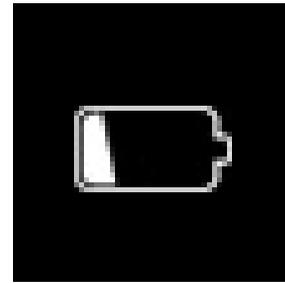
### Battery Charge

The device is connected to battery charger or USB port.



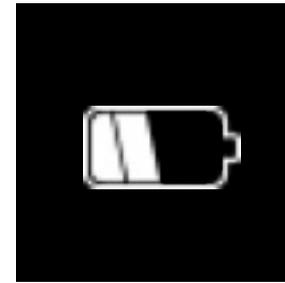
### Less than 10%

Less than 10% of the battery charge is remaining.



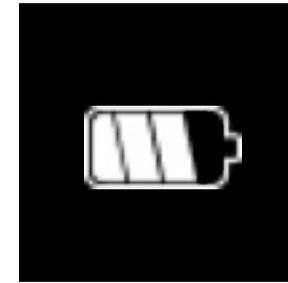
### 10% to 35%

10% to 35% of the battery charge is remaining.



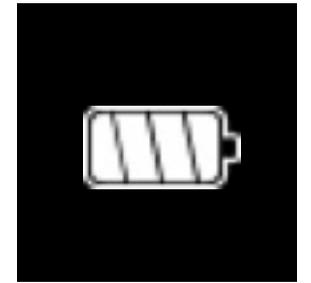
### 35% to 65%

35% to 65% of the battery charge is remaining.



### 65% to 85%

65% to 85% of the battery charge is remaining.



### More than 85%

More than 85% of the battery charge is remaining.

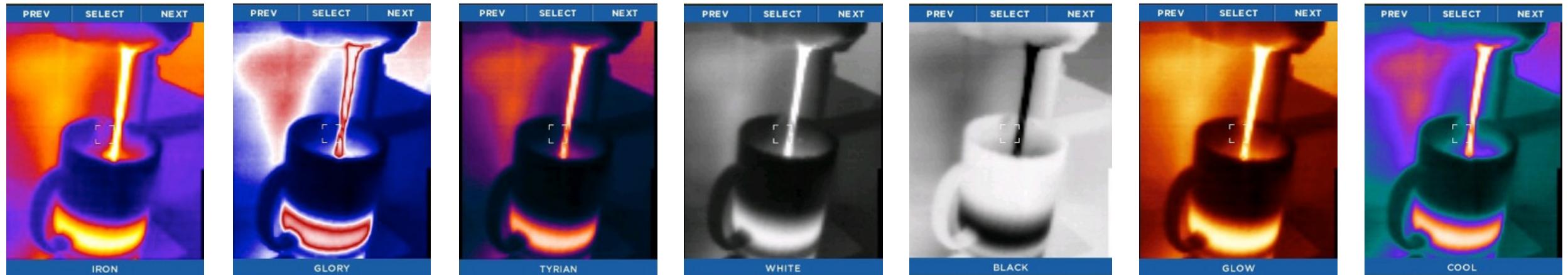
*Table 1: Icon function and descriptions*



# QUICK START GUIDE

## Filters

There are seven filters (also known as LUTs) you can apply to colorize the image. After selecting **FILTERS** via the **LEFT** button, press the **LEFT** or **RIGHT** button until the desired image filter is displayed, then select it via the **CENTER** button. Filters are subjective to the user and preferred based on objects emitting heat. Feel free to play around and adjust to your preference. We launch the device as default on Tyrian. Reveal will remember your selected filter.

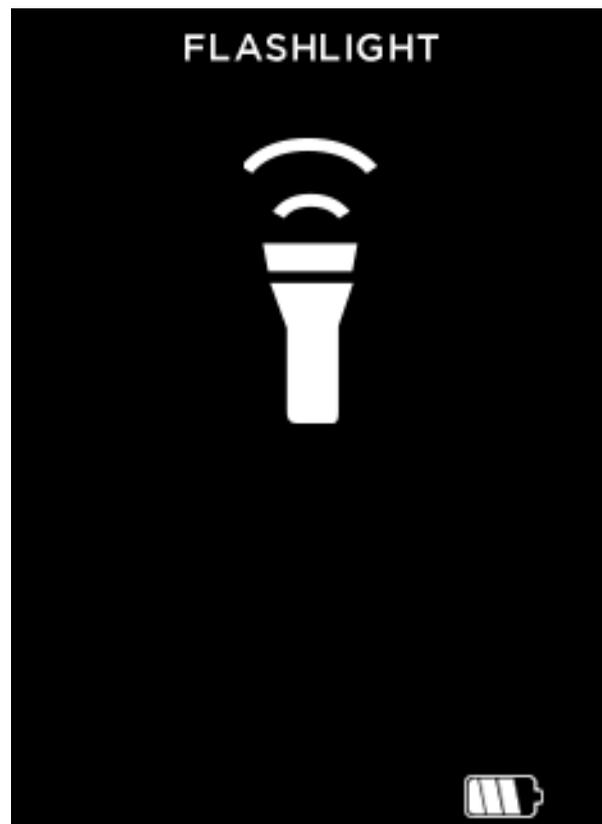


*Table 2: Names and examples of filters*

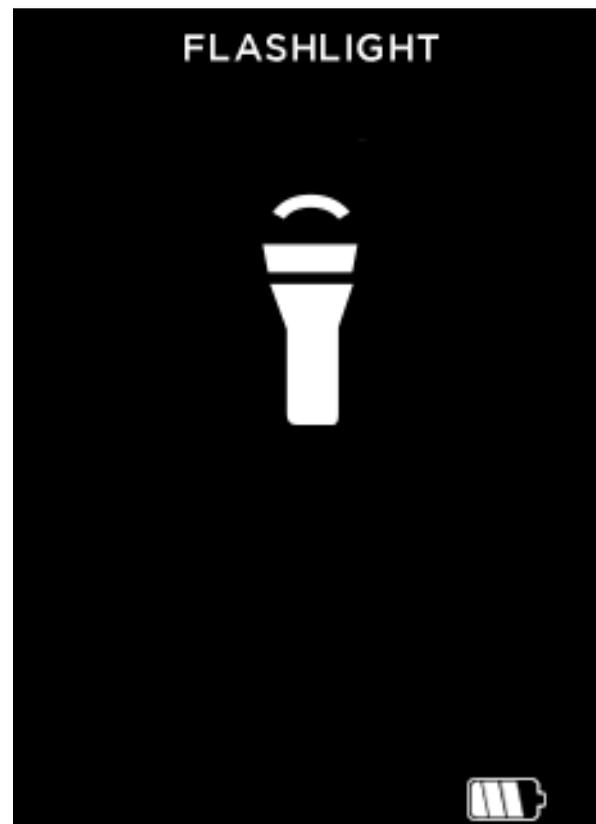


# FLASHLIGHT OPERATION

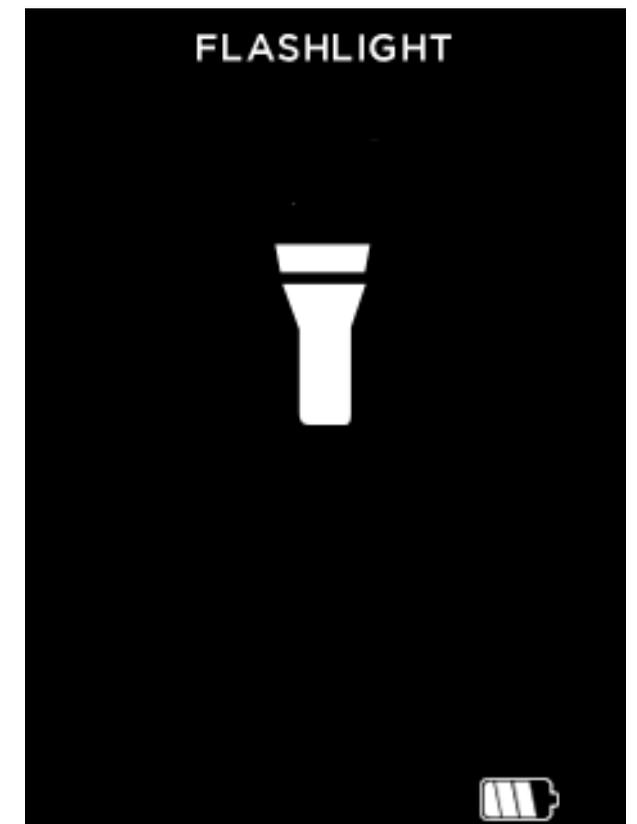
The right SIDE button on your Reveal is dedicated to always be for the Flashlight. Pressing the SIDE button once powers the LED flashlight to its high-intensity setting. A second press of the SIDE button powers the flashlight to its low-intensity setting, and the third press causes the flashlight to turn off. When Reveal is off, pressing the SIDE button will display the flashlight's setting on the screen. When Reveal powered on, the flashlight's operation will not be displayed on the screen.



*Figure 36: Flashlight On, High Intensity screen*



*Figure 37: Flashlight On, Low Intensity screen*



*Figure 38: Flashlight Off screen*



# RESTORE FACTORY SETTINGS

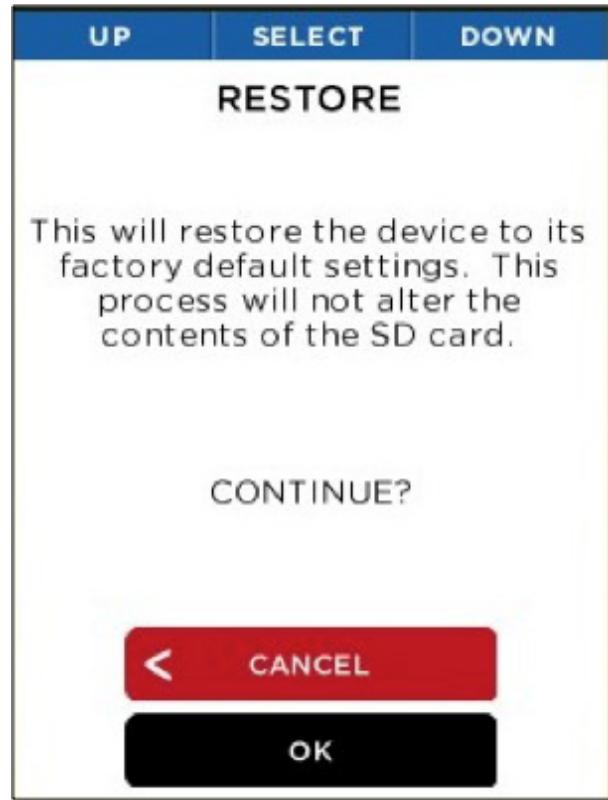


Figure 39: Restore screen



Figure 40: Successful Restore screen

The Restore option allows the user to restore all of the settings to the default and options that reflect the state of the device when it left the factory. After power-cycling, the user will then be required to perform the setup process again. This set up should take less than 90 seconds or so.

# DOWNLOADING IMAGES

## microSD Card



*Figure 41: Reveal showing the rear door open and the microSD card slot highlighted.*



*Figure 42: microSD card*



*Figure 43: microSD card and adapter (adapter not included).*

Insert your microSD card (see Figure 42) into the memory slot on Reveal (see red highlighted slot in Figure 41). You can then use the Seek Reveal as you normally would, capturing images, transferring them to your computer, etc. Your microSD card can also be erased and reused, whether on your PC via an adapter (see Figure 43), in your Reveal, or via a USB connection. The Seek Reveal is designed to hold a maximum 32G card should you choose.

The microSD card is designed to fit easily into the Reveal one way only. With the Reveal in the position shown in Figure 45, the microSD card should be easily installed with the notch on the right and the contacts facing downward. Do not bend the card or force it into the slot.

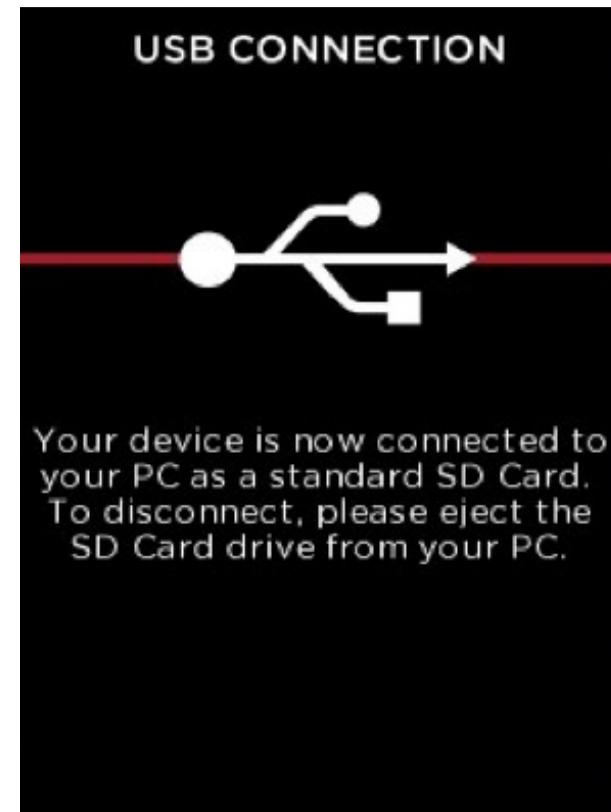
# DOWNLOADING IMAGES

## USB Port

Connect the USB cable to your computer and the microSD card should become visible as a storage device or removable drive (see Figure 55 and Figure 56). Once visible, open the DCIM folder to access the photos. You can copy or drag photos to your computer (Mac or PC or Tablet/Mobile) for storage. The photos are a standard .PNG format and can be edited, annotated, and inserted into documents easily. At this stage, RAW File layers are not saved.



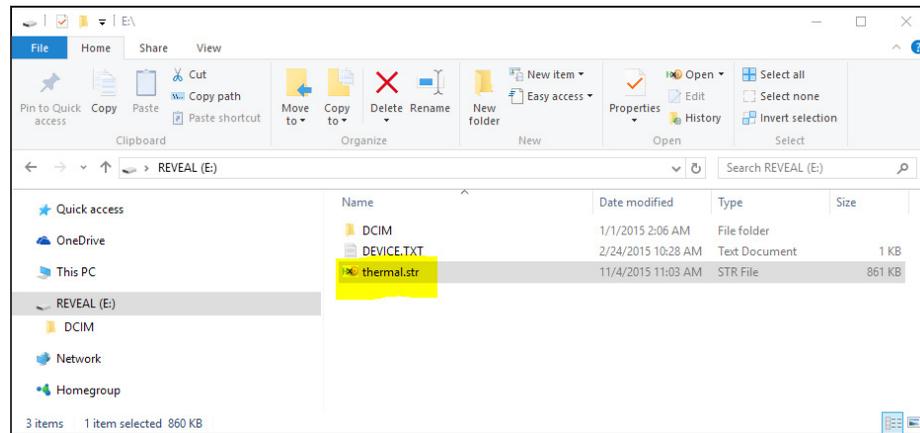
*Figure 44: Reveal showing the rear door open and the USB port (for connectivity) highlighted.*



*Figure 45: USB Connection screen*



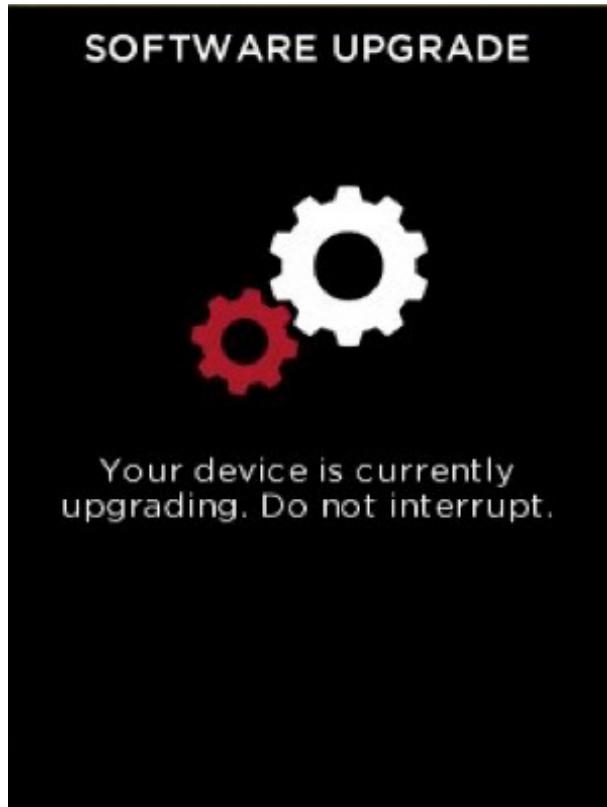
# SOFTWARE UPDATES



*Figure 46: The upgrade file on the SD card*

1. Connect the Reveal to a computer (PC or Mac) via USB. The computer will recognize the Seek Reveal and open the microSD card as a storage device. You may rename the storage drive as you would any other file.
2. Locate the software update at [thermal.com/revealsupport](http://thermal.com/revealsupport) in your browser.
3. Download the update file to your computer.
4. Once the download is complete, then copy the update file to the main (root) directory of Reveal's microSD card. It should already be named "thermal.str". You can simply drag this file from your computer download location to the storage device. It's critical that the file is placed at the Root directory on the device.
5. Eject the device from your computer and disconnect the USB cable to start the upgrade.
6. If the upgrade does not automatically begin, powering up the Reveal will trigger the upgrade of the software to occur, and the Software Update screen (see Figure 51) to display. It will remind you to DO NOT touch once the software is updating. In less than 1 minute, the Reveal will be ready for use with the new software. The About screen will display the new software version.

# SOFTWARE UPDATES



*Figure 47: Software Upgrade screen*



*Figure 48: Failed Software Upgrade screen*

# CARE GUIDE

## **WARNING**

*Failure to follow these safety instructions could result in fire, electric shock, injury, or damage to the device or other property. Read all the safety information below before using the device.*

**Handling:** Handle your Reveal with care. It is made of metal, glass, and plastic and has sensitive electronic components inside. The device can be damaged if excessively dropped, burned, exposed to extreme temperatures, punctured, crushed, or otherwise exposed to conditions beyond the operating limitations outlined in this document. Do not use the device if damaged (such as if the screen or lens is cracked), as it may cause injury. Cables should also be handled with care. Always pull on the connector, not the cable, during disconnection. Frayed cables or cables with portions of their insulation missing should be replaced immediately and not used.

**Repairing:** Do not open the device and do not attempt to repair it yourself. Disassembling the device may damage it or may cause injury to you. Disassembling your device voids all warranty terms. If the device is damaged, malfunctions, or exhibits other detrimental characteristics, contact Seek Thermal support team. You can find more information about service and support at [support.thermal.com](https://support.thermal.com).

**Cleaning:** Keep the device free from mud, grime, grease, oil, etc. To clean the screen on your Reveal, use a soft, lint-free cloth. We suggest you use a microfiber cloth. Never use a paper towel or other paper-based towels as they can leave scratches on the screen. For fingerprint smudges, dust, and lint, wipe the screen gently using a dry microfiber cloth. Never use window cleaners, harsh chemicals, or cleaning solvents on your Reveal and never spray anything directly onto the screen. Lightly dampen a section of a microfiber cloth with water and gently wipe the screen, then go over it again with a dry section of the cloth to wipe away any moisture. Avoid getting moisture in any of the openings. Cables should be kept free from dirt and grease, as well. Connectors should be clean and dry at both ends of the cable, too.

# CARE GUIDE

## **Battery**

**DO NOT ATTEMPT TO REPLACE THE BATTERY YOURSELF.** You may damage the battery, which could cause overheating and injury. The lithium-ion battery in the device should be replaced only by Seek Thermal and must be recycled or disposed of separately from household waste. Don't incinerate the battery.

**Charging:** Charge the device with the included USB cable and power adapter, or with other approved power adapters compatible with USB 2.0 or later.

## **Storage**

To maximize battery longevity and life, if the device is going to be in storage for long periods of time (i.e., more than six months), it is best to recharge the battery to 75% capacity after six months.

## **Optics and Display**

The display can be cleaned using alcohol applied to a soft, clean cloth before wiping the display screen. Paper products are not recommended, as they may scratch the glass cover of the display.

The camera and flashlight lenses can be cleaned with alcohol as well using a cotton swab. It is not recommended that other chemicals be utilized, as they may remove the lens coating.

Protect them both from being banged or scratched by large tools as Reveal is used or stored.

## **microSD Card and USB Port**

There are adapter cards that allow a microSD card to be used in an SD card slot or a USB port. This is a convenient way to use a microSD card with a card reader on a PC, to transfer files between a PC and Reveal. Both the microSD Card and adapters should be kept clean and free of contaminants. When handling the card or adapter, avoid touching the exposed metal contacts. Follow the microSD card manufacturer's recommendations.

Do not dispose of your microSD card with unsorted household waste. Improper disposal may be harmful to the environment and human health. Please refer to your local waste authority for information on return and collection systems in your area.

# CARE GUIDE



*Figure 49: Micro-B USB male cable*

The USB port is a micro-B female. The same cable (see Figure 49) that is used for cell phone connection to a PC will work on Reveal (A micro-B male on one end, and a Type-A male on the other). Both the USB port and cable should remain dry and free from contaminants. Should sand or other dry foreign materials get into the USB port, compressed air may dislodge them. Do not insert anything into the port, as damage may occur. Cables that are frayed, or with missing portions of insulation, should be replaced and not used.

## WEEE

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Seek Thermal offers all end users in the EC the possibility to return “end-of-life” devices without incurring disposal charges.

This offer is valid for Seek Thermal’s electronic equipment if it is:

- Marked correspondingly with the crossed-out “wheelie bin” logo (see Figure 50)
- Still complete, not disassembled, and not contaminated

As the WEEE directive applies to self-contained operational electrical and electronic products, this “end-of-life” take-back service does not refer to other Seek Thermal products, such as:

- Pure OEM products, as in assemblies to be built into a device by the user (e.g. camera cores and components)
- Components
- Mechanics and optics
- Extra parts of devices disassembled by the user (PCBs, housings, optics, etc.).



# CARE GUIDE

## WEEE (continued)

If you wish to return a Seek Thermal device for waste recovery, please contact Seek Thermal or an authorized dealer for further information.

### Waste treatment on your own responsibility

If you do not return an “end-of-life” device to Seek Thermal, you must deliver it to a company specialized in waste recovery. Do not dispose of the device in a litter bin or a public waste-disposal site.

### Ecological background

It is well-known that WEEE pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE directive is to enforce the recycling of WEEE. A controlled recycling of end-of-life products will thereby avoid negative impacts on the environment.



*Figure 50: The WEEE symbol (crossed-out “wheelie bin”)*



# TROUBLESHOOTING

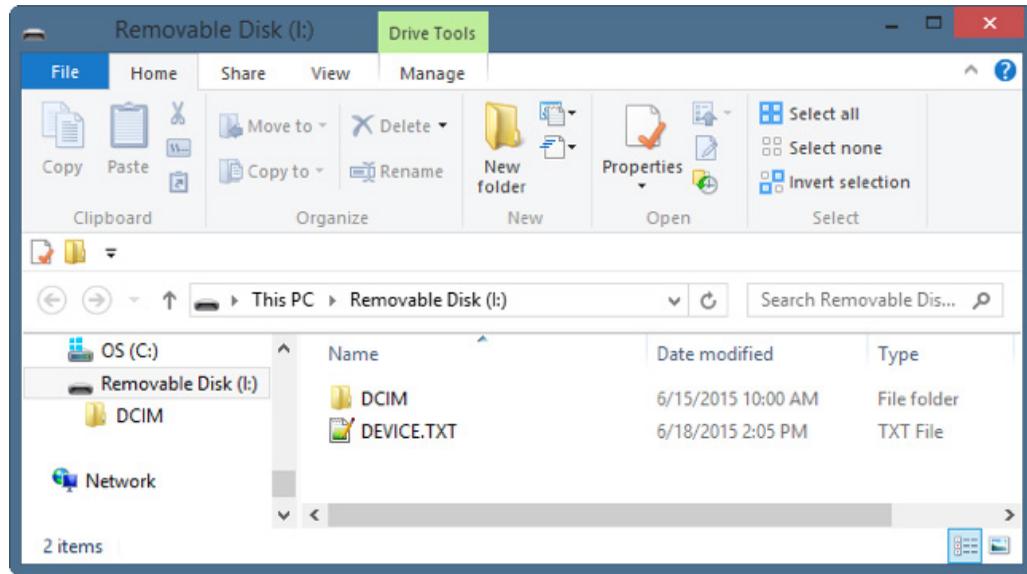


Figure 51: Reveal connected to a Windows PC

1. The device will not power on.
  - a. Try plugging the device in with the supplied wall charger or another 1-amp-rated charger to ensure there is enough battery remaining.
  - b. Try performing a hard system reset by holding down the CENTER button for thirty seconds, release and wait.
2. The device will not save or recall images.
  - a. Check if there a microSD card installed. Remember that it must be less than or equal to 32GB in capacity.
  - b. Check if the microSD card is full. If card is full, delete images or insert a new microSD card.
  - c. Try accessing the microSD card on your PC or Mac through an adapter.
3. The thermal image appears blurry.
  - a. Check that the lens is clear and clean.
  - b. Check that the screen is clean.
4. The thermal image appears noisy.
  - a. Has your flashlight been on for a long time?
  - b. Have you suddenly cooled or heated the device quickly?
5. I cannot find the device on my computer when I plug it into my USB port.
  - a. Check your file system (Explorer in Windows, Finder in Mac OS) and check your external memory devices as shown here:

# TROUBLESHOOTING

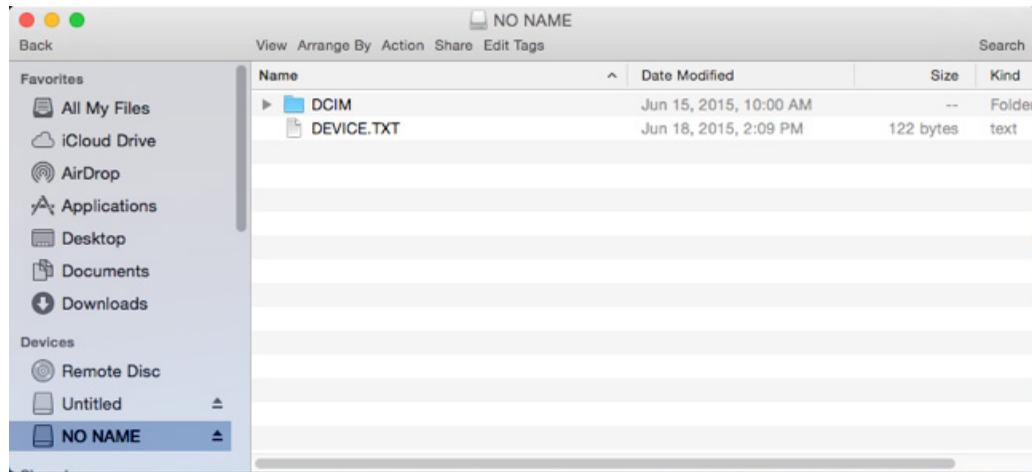


Figure 52: Reveal connected to a Mac OS

6. The flashlight is dimmer than usual.
  - a. Is your battery charged? The flashlight is an extremely high-powered light consuming a considerable amount of power. When the battery voltage drops to near empty, the flashlight will begin to dim to preserve battery life and allow the thermal imager to work.
7. The microSD Card will not stay inserted.
  - a. Be sure that the microSD Card or the slot is not damaged.
  - b. Be sure there are no foreign objects (i.e. lint, sand, etc.) in the slot preventing the microSD Card from being seated correctly.
8. If the battery is completely discharged and thermal imaging won't start.
  - a. Charge battery and power on thermal camera.
    - i. If screen displays all black, power-cycle your Reveal.

If none of these suggestions work, please refer to TECHNICAL / ORDER SUPPORT : [SUPPORT@THERMAL.COM](mailto:SUPPORT@THERMAL.COM) and 1-(844) SEE-HEAT.

# APPENDIX

## Device Specifications

### Environmental

<b>Operating Temperature</b>	14° to 149° F (-10° to 65° C)
<b>Storage Temperature</b>	-40° to 131° F (-40° to 55° C)
<b>Battery Charge Temperature</b>	32° to 113° F (0° to 45° C)
<b>Ingress Protection</b>	Water and dust resistant
<b>Shock</b>	Drop test per 1 meter onto pavement
<b>Humidity</b>	Operating and storing 10% to 95%, non-condensing

### Thermal Camera

<b>Thermal Sensor</b>	
Technology	Uncooled Vanadium Oxide Micro-bolometer
Resolution	32,136 Total Pixels in a 206x156 Pixel Array
Frame Rate	< 9 Hz
Spectral Response	7.5 - 14 Microns
<b>Temperature Measurement Type</b>	Passive
Sensitivity @ F/1	< 0.1°C (< 0.18°F)
Detection Range	-40° to 330° C (-40° to 626°F)
Accuracy @ 25°C	Greater of 5° C or 5% (9° F or 5%)

# APPENDIX

## Device Specifications

### Thermal Camera (continued)

<b>Optics</b>	
Technology	Chalcogenide Glass w/Anti-reflective Coating
Focal Length	4 mm
F/#	F/1.2
Focus Range	6 inches to infinity
Field of View	44° Diagonal, 27° Horizontal, 36° Vertical
Detection Distance	Up to 500 feet

### Flashlight

<b>Type</b>	LED
<b>Lumens</b>	
Default Hi	300 lm
Default Low	120 lm
<b>Spot Field of View</b>	7°
<b>Flood Field of View</b>	70°



# APPENDIX

## Device Specifications

### Display

<b>Type</b>	2.4" TFT Color LCD
<b>Resolution</b>	240x320 (QVGA)
<b>Viewing Angle</b>	> 70 Degrees
<b>Contrast Ratio</b>	500:1

### Battery

<b>Technology</b>	Polymer Lithium Ion
<b>Capacity</b>	1900mAh
<b>Voltage</b>	3.7V nominal
<b>Charge Current</b>	
On included power adapter	< 1A
In live USB port	< 0.5A
<b>Battery Life</b>	
Thermal Camera Only	10 hours
Light (100%)	2 hours
In storage (from 100% charge)	60 Days

# APPENDIX

## Device Specifications

### Others

#### Storage

SD Card	Removable microSD, up to 32GB
File System	FAT32
Photos/Images	Portable Network Graphics (PNG) format
Time & Date Stamp	Yes
# Images (512MB) @224KB each	> 2200
# Images (32GB) @224KB each	> 142000

#### USB Connection

USB Port	Micro-B
Mass Storage Class	Windows, MAC OS 9 & X, Linux
Upgrade Software	<a href="http://thermal.com/revealsupport">thermal.com/revealsupport</a>

#### Accessories

Belt Clip/Tripod Mount	Universal belt clip and 1/4"-20 mount for tripods
------------------------	---

#### Manufacturer Warranty

Device	1 year basic +1 year with product registration within 90 days of purchase
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# APPENDIX

## Conformities

### Standard

### Description

**EN 61326-1:2012**

Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

**EN 61326-2-2:2013**

Electrical equipment for measurement, control and laboratory use. EMC requirements. Part 2-2 Particular requirements – Test Configurations, operational conditions and performance criteria for portable test measuring and monitoring equipment used in low-voltage distribution systems.

**CISPR 11: 2009**

*Amendment 1:2010*

Industrial, scientific and medical (ISM) radio-frequency Equipment. Electromagnetic disturbance characteristics. Limits and methods of measurement

**IEC 61000-3-2: 2005**

*+Amendment 1:2008*

*+Amendment 2:2009*

Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current = 16 A per phase)

**IEC 61000-3-3:2008**

Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current = 16 A per phase and not subject to conditional connection

**IEC 61000-4-2:2008**

Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test

**IEC 61000-4-3:2006**

*Amendment 1:2007*

*Amendment 2:2010*

Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

# APPENDIX

## Conformities

### Standard

### Description

**IEC 61000-4-4:2004**

Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement

*Amendment 1:2010*

Techniques – Electrical fast transient/burst immunity test

**IEC 61000-4-5:2005**

Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test

**IEC 61000-4-6:2008**

Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields

**IEC 61000-4-8:2009**

Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test

**IEC 61000-4-11:2004**

Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests

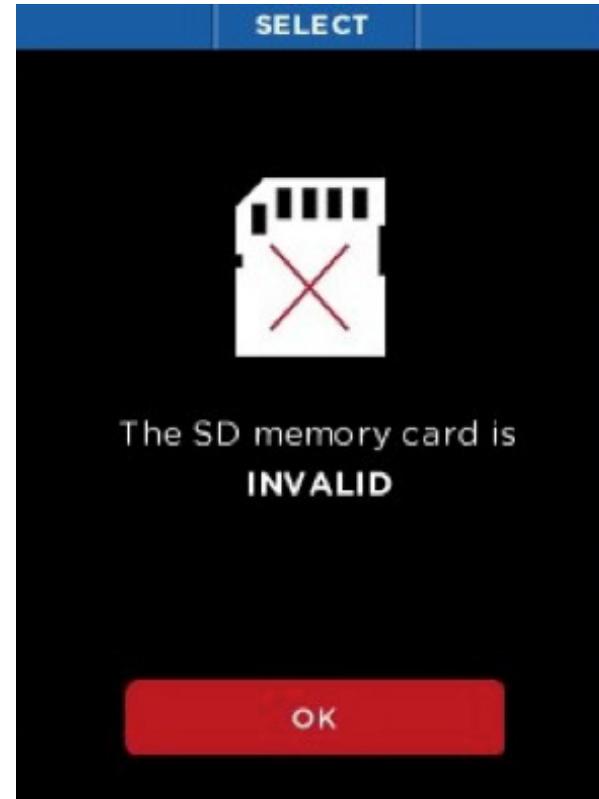
# APPENDIX

## Error Screens



*Figure 53: Photo Not Available Screen*

If the Gallery encounters a corrupted image, this screen is displayed as a placeholder instead of the image.

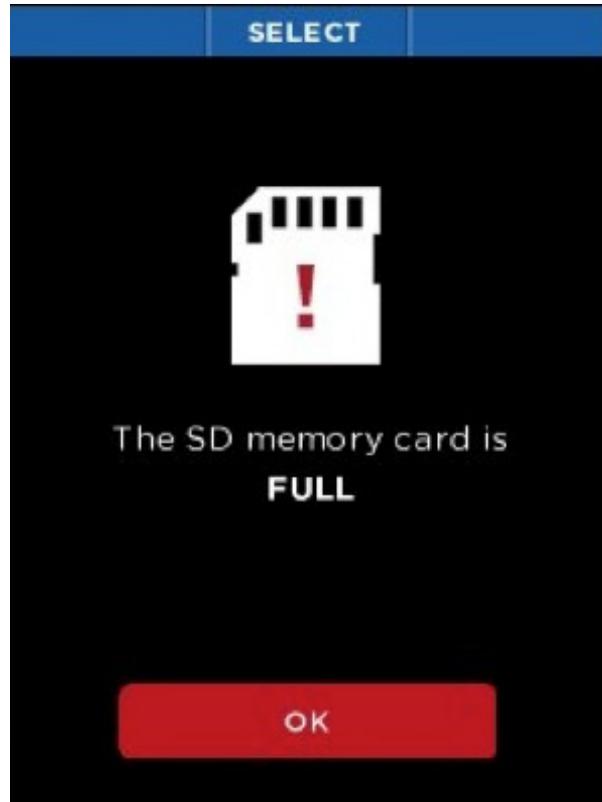


*Figure 54: SD Memory Card Invalid Screen*

If this screen is displayed, something occurred to the formatting of the microSD card. First, remove SD card and then re-insert to be sure that it is seated correctly. If the screen still appears, reformat the SD card on a computer.

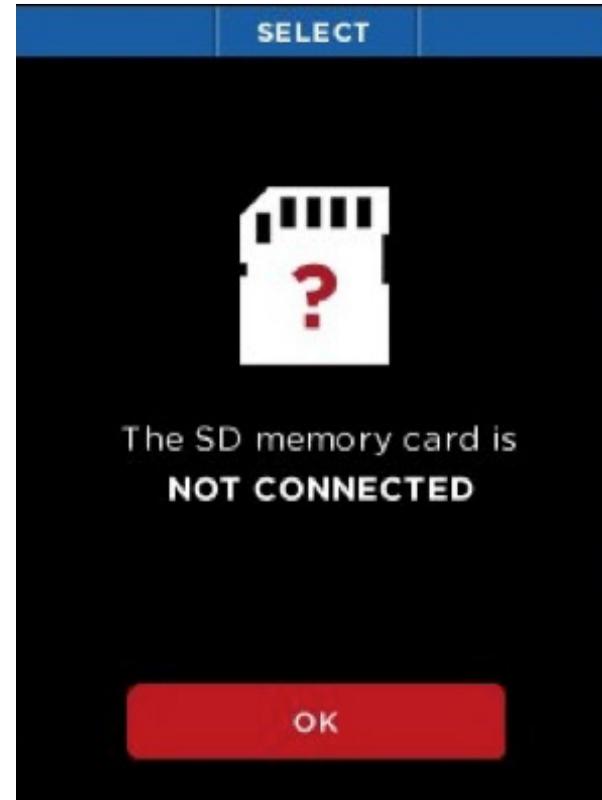
# APPENDIX

## Error Screens



*Figure 55: SD Memory Card Full Screen*

If a photo capture is attempted when there is not enough memory available to save the image, this screen is displayed.



*Figure 56: SD Memory Card Not Connected Screen*

If a photo capture is attempted when the USB card is removed, this screen appears.

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