

**PKMag<sup>®</sup> 50**  
**HD Handheld Video Magnifier**  
**User's Guide**

440643-001 Rev. B

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## Technical Support

To contact **Technical Support** by telephone, U.S. customers can call **(727) 803-8600**, Monday through Friday, 8:30 AM to 7:00 PM (Eastern Time).

To contact by e-mail, send questions to **[Support@FreedomScientific.com](mailto:Support@FreedomScientific.com)**.

To contact using the Web, visit **[www.FSInspection.com](http://www.FSInspection.com)**, choose **Support**, and complete the form.

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## Read Me First

- Before using PKMag<sup>®</sup> 50 for the first time, you must charge its battery. A full charge takes approximately three hours.

Refer to **Charging the Unit** on page 10 for battery charging procedures.

Refer to **Battery LED Descriptions** on page 12 for battery status descriptions.

- For the basics to help you get started using PKMag 50, read **Quick Start** on page 7.
- For an overview of PKMag 50 and its operation, review the information in this guide first.

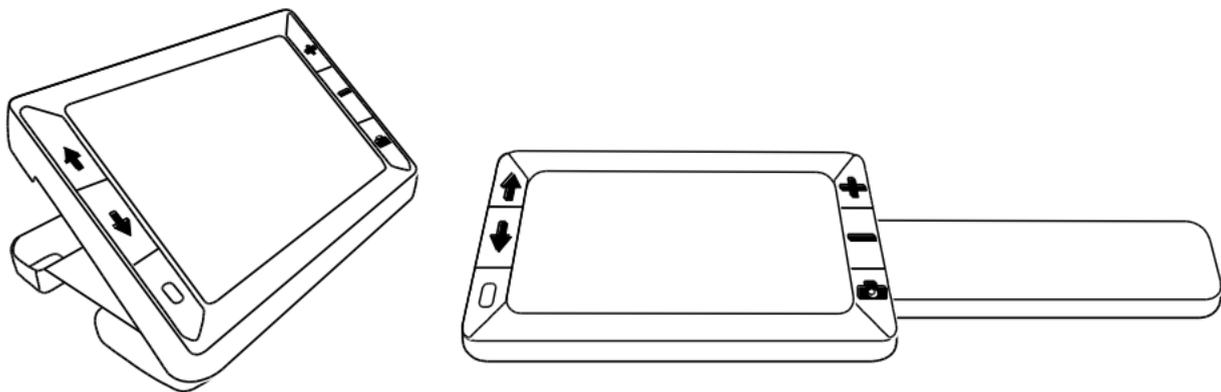
## Overview

Thank you for purchasing PKMag 50.

PKMag 50 is a portable, handheld video magnifier that can magnify an object from two to 14 times its size. It has a 5-megapixel, auto-focus camera that provides sharp HD quality images that are easily viewed on its full color, 5-inch LCD screen.

The unit has both an integrated fold-away handle and viewing stand. The handle allows you to hold the magnifier close to an object, press the magnification buttons for continuous zoom from 2x to 14x, and then freeze the image on the screen. If you like, you can then make any necessary magnification adjustments.

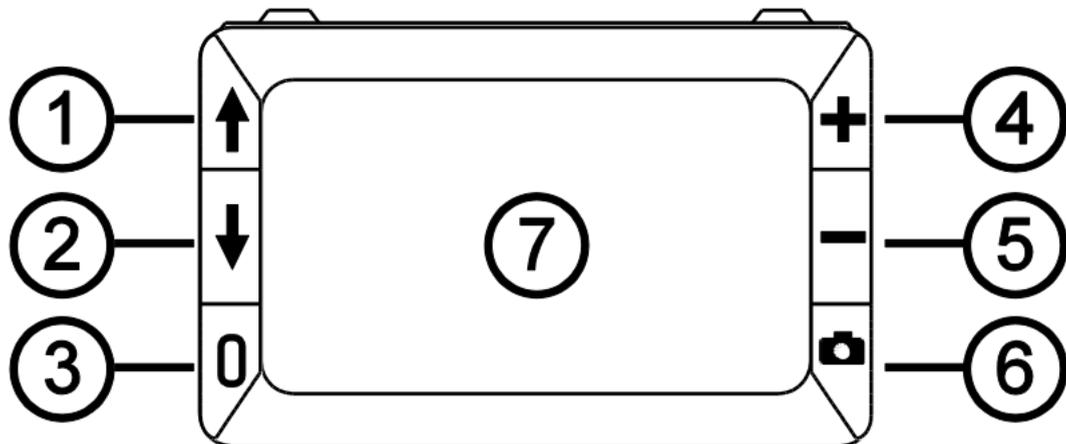
With the stand open, you can place the unit directly on an item for hands-free viewing, or set it on a table while viewing a frozen image.



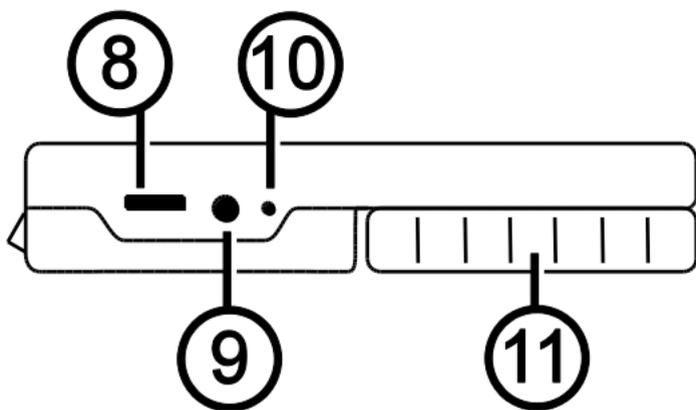
The unit has 100 MB of storage. Saved images are uncompressed bitmaps and range in size from 14,763 KB for images captured at lowest magnification to 381 KB for images captured at highest magnification. Saved images can easily be copied to a computer through a simple USB connection.

The unit also has a reference line and masking feature to help align and focus attention on a specific area of the image displayed on the LCD screen.

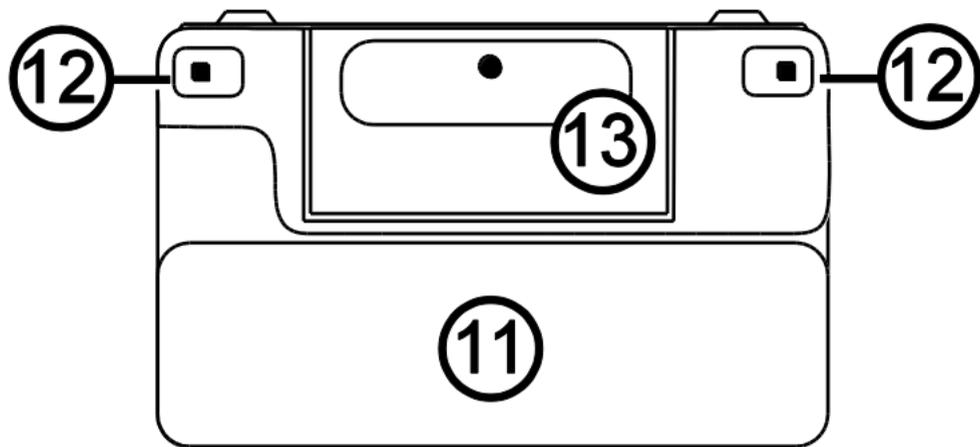
## Hardware Description



- |                                  |                                    |
|----------------------------------|------------------------------------|
| 1. Color Mode Scroll Up (Blue)   | 4. Magnification Increase (Yellow) |
| 2. Color Mode Scroll Down (Blue) | 5. Magnification Decrease (Yellow) |
| 3. Power (Green/Yellow)          | 6. Freeze Frame (Red)              |
|                                  | 7. LCD screen                      |



- 8. USB port (micro-USB)
- 9. Power connector (5V; 2.1A)
- 10. Battery LED
- 11. Handle in closed position



11. Handle in closed position

12. LED lights

13. Camera (5 MP)

## Quick Start

Below are steps to quickly set up and use the unit for the first time.

1. Make sure the unit is fully charged. Refer to page 10.
2. Turn the unit on by pressing the green/yellow button . Refer to page 13.
3. Do one of the following:
  - Rotate and extend the handle to hold and use the unit like a magnifying glass. Refer to page 14.
  - Open the stand to place the unit on a flat surface. Refer to page 15.
4. Adjust the magnification using the yellow buttons ( or ). Refer to page 18.

5. Select a color mode ( or ) that best suit your vision needs. Refer to page 19.
6. Freeze the image  on the LCD screen so that you may take your time and inspect details in the image. Refer to page 19.
7. Save the image or return to live view . Refer to page 25.

Once you become comfortable using the unit, try the following advanced features.

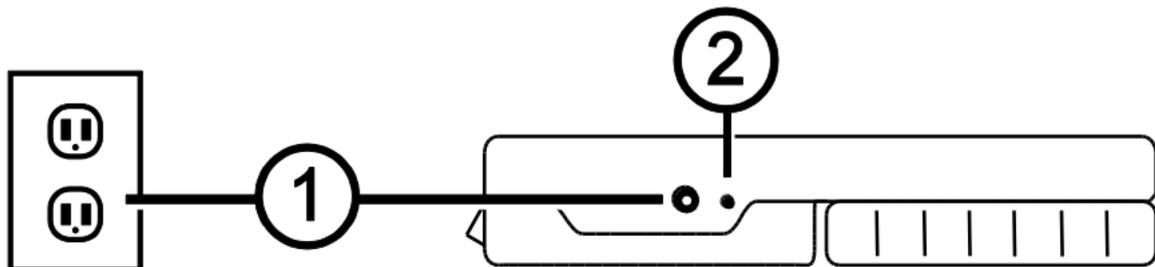
- Turn the LED lights on or off to adjust for glare and reflections when viewing an item. Refer to page 20.
- Use the reference line and masks to help you align the object that you are viewing on the unit's screen. Refer to page 21.

- Save, view, and delete images stored on the unit as described on pages 24 through 28
- For additional storage, transfer images from the unit to your computer as described on page 30

## Charging the Unit

**Note:** You must use the supplied power adapter to charge the unit. It cannot be charged using the computer's USB port.

1. Plug one end of the power adapter into the unit and the other end into a wall outlet (1).



2. The battery indicator LED blinks green to show that the battery is charging (2).

3. The LED stops blinking and glows a steady green once the battery is charged. Unplug the power adapter from the unit. The battery indicator LED turns off.
4. You can now use the unit for approximately three hours of continuous use. When the battery is low, the battery indicator LED flashes red. Connect the power adapter and plug it in to recharge the battery.

## Battery LED Descriptions

**Green – Solid:** Battery charged – power adapter connected

**Green – Flashing:** Battery charging – power adapter connected

**Red – Flashing:** Battery low

**Red – Solid:** Error – unplug power adapter, wait a few seconds, and plug in again

## Button Descriptions



**Power (Green/Yellow):** Press to turn power on. Press it again to turn power off.



**Magnification (Yellow):** Press and HOLD for continuous zoom magnification with live images. When viewing frozen images, press and release to incrementally increase or decrease magnification.



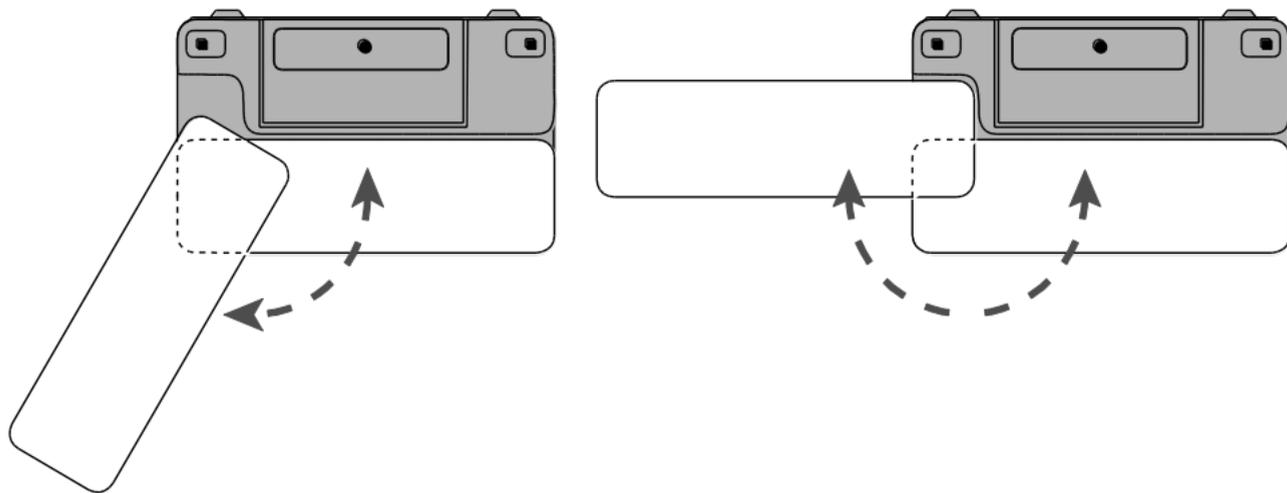
**Color Mode (Blue):** Press to switch between full color and grayscale.



**Freeze Frame (Red):** Press to freeze the current image. Press it again to turn off Freeze Frame mode and return to live view.

## Opening and Closing the Handle

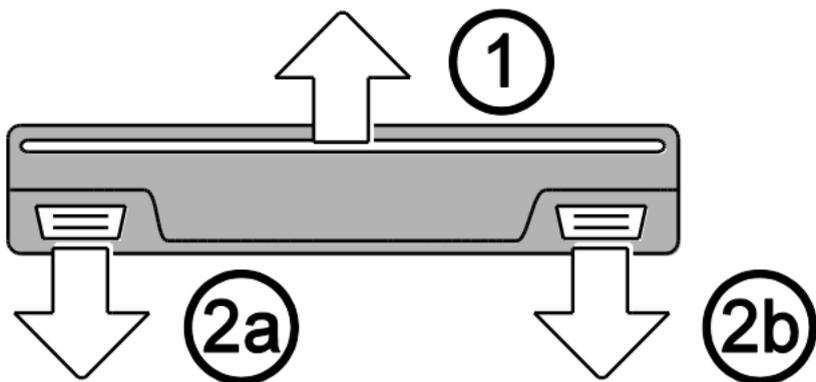
The handle rotates to two open positions so that the unit can be held like a magnifying glass.



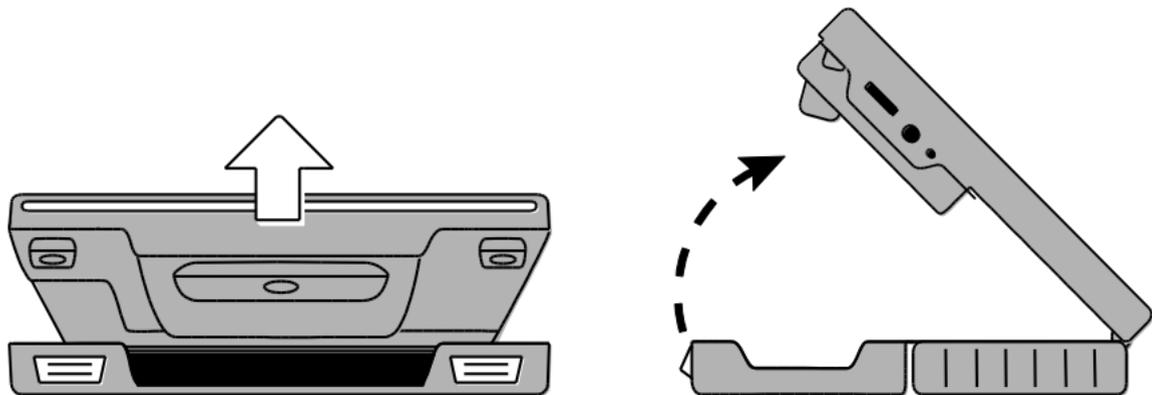
## Opening and Using the Viewing Stand

The unit also incorporates a viewing stand so that it can be set on an item for hands-free inspection.

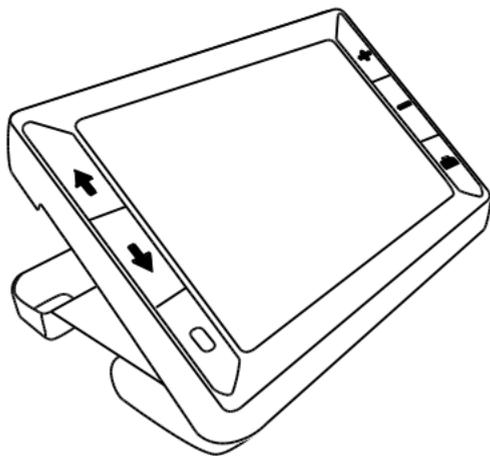
1. On the top edge of the unit, use one thumb to push the ridge (1) in one direction while using your other thumb to push one of the tabs (2a or 2b) in the opposite direction.



2. The unit is spring loaded and opens to its full viewing position. If the unit is off, it automatically turns on when the stand opens.



3. In this position, small objects can be placed on a table and then the unit can be placed over those objects for closer inspection.



4. When you close the stand, the unit automatically turns off.

## Magnifying Live Images

When viewing a live image, you can use continuous zoom magnification between 2x and 14x.

- Press and HOLD the yellow PLUS button **+** to zoom in.
- Press and HOLD the yellow MINUS button **-** to zoom out.

## Magnifying Frozen or Saved Images

You can freeze and then save an image that displays on the LCD screen. When viewing a frozen or saved image, you can zoom in or out in incremental steps by pressing the yellow buttons (**+** or **-**).

For steps to freeze an image, refer to **Freezing an Image** on page 19.

To access saved images, refer to **Viewing Saved Images** on page 27.

## Switching Between Full Color and Grayscale

The unit supports full color and grayscale color modes.

To switch between color modes, press either blue arrow button (↑ or ↓).

## Freezing an Image

To freeze an image on the screen, do the following:

1. Press the red button  to freeze the image.

If you like, press the yellow PLUS button  to increase magnification, or the yellow MINUS button  to decrease magnification.

2. Press the red button  again to turn off Freeze Frame mode and return to the live view.

**Note:** To save a frozen image, press and HOLD the red button  for three seconds. Refer to **Storage Mode** on page 24 for more information.

## Turning LED Lights Off

When you turn on the unit, the LED lights also turn on. To avoid glare when viewing reflective surfaces, you can turn off the LED lights.

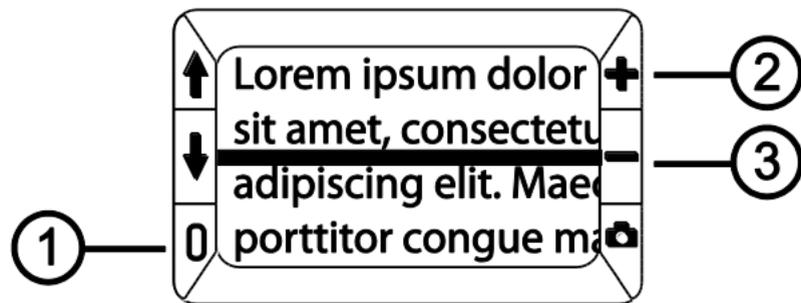
1. Press and HOLD the green/yellow button , and then press the red button . The LED lights turn off.
2. To turn the lights on again, press and HOLD the green/yellow button , and then press the red button .

## Using the Reference Line or Masks

The reference line is a horizontal line that displays on the screen. Use it for positioning an object on the screen before capturing the image. The masks block part of the screen to show a horizontal slice. The following describes how to display the line and masks.

### Displaying Reference Line

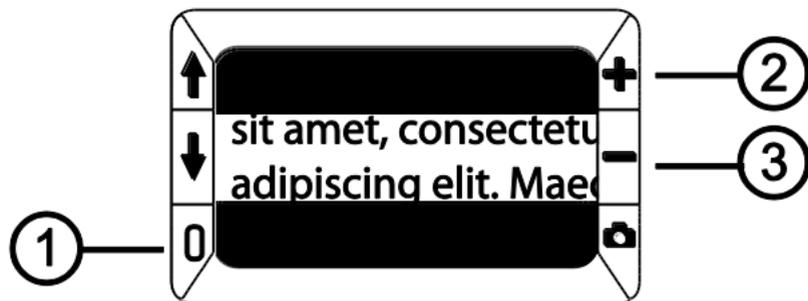
1. Press and HOLD the green/yellow button  (1) and then press both yellow buttons ( and  (2 and 3)). The reference line displays on the screen as shown in the next figure.



2. Press and HOLD the green/yellow button  (1) and then press the yellow PLUS button  (2) or the yellow MINUS button  (3) to move the reference line up or down on the screen.
3. To remove the line from the screen, press and HOLD the green/yellow button  (1) and then press and HOLD both yellow buttons ( and  (2 and 3)).

## Displaying Masks

1. Press and HOLD the green/yellow button  (1) and then press both yellow buttons (**+** and **-** (2 and 3)) again to remove the reference line and display the masks on the screen as shown in the next figure.



2. Press and HOLD the green/yellow button  (1) and then press the yellow PLUS button **+** (2) or the yellow MINUS button **-** (3) to increase or decrease the distance between the masks.

3. To remove masks from the screen, press and HOLD the green/yellow button  (1) and then press and HOLD both yellow buttons ( and  (2 and 3)).

## Storage Mode

The unit has 100 MB of storage. Saved images are uncompressed bitmaps and range in size from 14,763 KB for images captured at lowest magnification to 381 KB for images captured at highest magnification.

While in Storage mode, you can do the following:

- Save an image with its current magnification and color settings just as displayed on the screen
- Delete an image

When you first store an image, it is saved with the current magnification and color settings just as displayed on the screen. When viewing a saved image, you can change the magnification level.

## Saving an Image

After freezing an image on the screen by pressing the red button , you can save it by doing the following.

1. Press and HOLD the red button  for three seconds to enter Storage mode.

The Save Image check box  is automatically selected and displays for three seconds. This indicates that the image will be saved after exiting Storage mode and returning to live view.

2. Do one of the following:
  - Press and HOLD the red button  for three seconds to exit and return to live view
  - Press the blue arrow buttons ( or ) to advance to other images
  - Delete any image saved on the unit as described in the next section

## Deleting an Image

To delete an image while in Storage mode,

1. Press and HOLD both yellow buttons ( and ) to clear the check box . When you exit Storage mode, the image is deleted.
2. Press and HOLD the red button  for three seconds to exit and return to live view.

## Viewing Saved Images

You can easily scroll through images saved on the unit by pressing the blue arrow buttons (↑ and ↓).

1. Press and HOLD the red button  for approximately six seconds to enter Review mode.
  - To scroll forward through the saved images, press the blue UP arrow (↑)
  - To scroll backward through the saved images, press the blue DOWN arrow (↓)

**Note:** You can also zoom in or out using the yellow buttons (+ and -).

2. Press and HOLD the red button  for approximately three seconds to exit and return to live view.

## Saving an Image When Memory is Full

The unit has 100 MB of storage. If you try to save another image when the unit's memory is full, the Memory Full icon  displays on the screen. To add another image, you must first remove one or more saved images from memory.

1. Press the blue UP arrow () or the blue DOWN arrow () to step to an image that you want to delete.
2. Press both yellow buttons ( and ) to clear the check box .
3. Press and HOLD the red button  for three seconds to exit Storage mode. The new image is saved, and all unchecked images are deleted.

**Note:** To free space on the unit, you can also move images to a computer. For more information, refer to **Transferring Images to a Computer Using the USB Cable** on page 30.

## Storage Mode Icons



**Save:** Press the two yellow buttons (+ and -) at the same time to select the check box. The image is saved when you exit Storage mode.



**Delete:** Press the two yellow buttons (+ and -) at the same time to clear the check box. The image is deleted when you exit Storage mode.



**Memory Full:** Indicates that the maximum number of images have been saved on the unit. You must mark one or more images for deletion  before you can save the current image.

## Transferring Images to a Computer Using the USB Cable

Images stored on the unit can be transferred to your computer using the supplied USB cable. To do this,

1. Connect the supplied USB cable to the unit (1) and the computer.



2. When connected,
  - The USB symbol and battery icon briefly display on the LCD screen

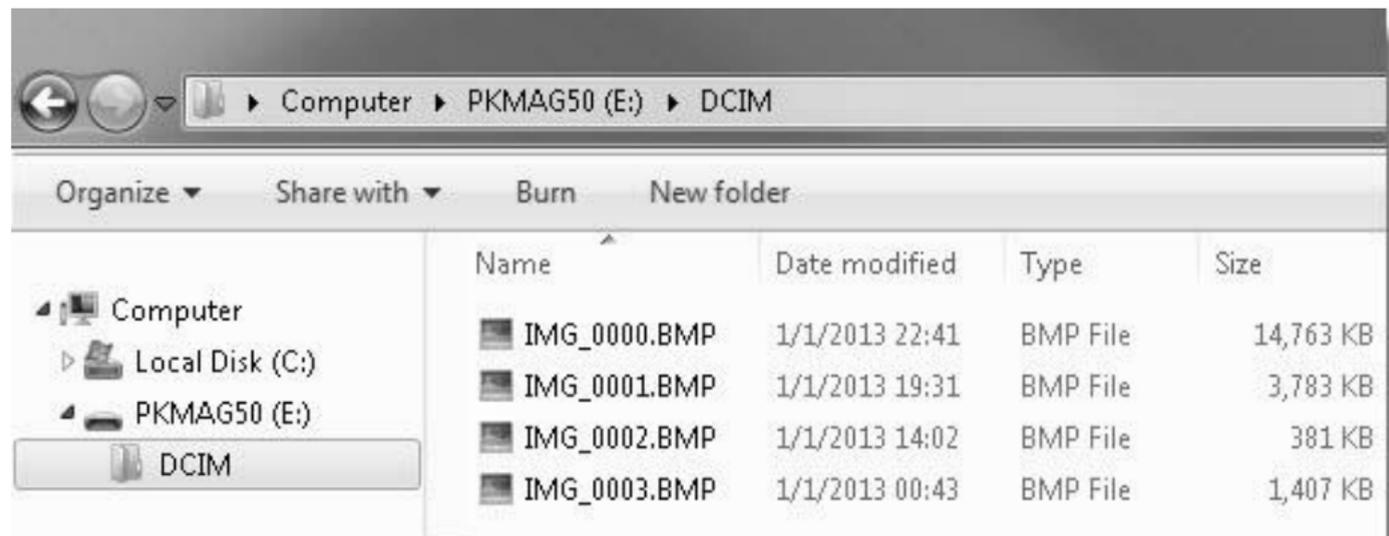


- The battery icon indicates the current battery status. **Images do not display on the screen while the unit is connected to a computer's USB port.**

**Note:** A USB port does not provide enough power to charge the battery. Use the power adapter to recharge a low battery.

- The unit displays as an external device in Windows Explorer or Finder (Mac)
3. Open the unit's DCIM folder and move or copy one or more images to a folder or the desktop on your computer. Images are named and are numbered in the order saved, for example, IMG\_0001.bmp, IMG\_0002.bmp, and so on as shown in the next figure.
  4. When you are finished transferring files, make sure that you safely eject (remove) the unit from your computer.

**Note:** To safely disconnect the unit and protect your data, always follow your operating system's procedures for removing a USB device.



## Transferring Images to PKMag 50 Using the USB Cable

Any image moved from PKMag 50 to your computer can easily be moved back to the unit.

**Note:** Only images saved by PKMag 50 can be copied back to the unit.

1. Make sure the unit is connected to your computer using the supplied USB cable.
2. Locate the image on your computer using Windows Explorer or Finder (Mac).
3. Select the image and drag it to PKMag 50's DCIM folder.
4. When you are finished transferring files, make sure that you safely eject (remove) the unit from your computer.

**Note:** To safely disconnect the unit and protect your data, always follow your operating system's procedures for removing a USB device.

## Auto Review Mode

You can create a slide show that loops continuously using the images saved on the unit. Each image displays for approximately five seconds. The order that images display is based on their file names, for example, IMG\_0001.bmp, IMG\_0002.bmp, and so on.

To rearrange the order that images display, you can transfer them to your computer, rename the files in the order that you like, and then transfer them back to the unit. (The file names should not be longer than eight characters followed by the BMP file extension.) To move files between the unit and computer, refer to the transfer procedures as described on pages 30 and 33.

**Note:** When in Auto Review mode, the 30-minute power-off timer is disabled.

To start, do the following:

1. Press and HOLD the red button  for approximately six seconds to enter Review mode.
2. Press and HOLD the green/yellow button , and then press the blue UP arrow .

The first image stored on the unit, based on its file name, displays on the LCD screen for approximately five seconds followed by the second image, the third, and so on.

3. Press and HOLD the red button  for approximately three seconds to exit Auto Review mode and return to live view.

## Troubleshooting

### The unit does not turn on.

- Press the green/yellow **Power** button. If the unit does not turn on, charge the battery.

**Note:** The battery does not charge when the unit is connected to a USB port.

### The screen is blank.

- If the unit is sitting on a flat surface, the screen is blank (black). Lift the unit off the surface, or open the stand.
- When the unit is connected to a computer via USB, the screen is blank.
- Turn the unit off and then on again.

- Verify that the item you want to magnify is positioned correctly under the camera window.
- Press the yellow **Magnification** buttons to step through the magnification levels.
- Press the blue **Color Mode** buttons to step through the color modes.
- When the stand is closed, the unit automatically turns off.

### **The battery LED is flashing red.**

- Charge the battery.

### **The battery LED is solid red while the power adapter is connected to the unit.**

- A battery error has occurred. Unplug the power adapter from the unit and plug it in again.

- If the problem continues, disconnect the power adapter and contact Freedom Scientific Technical Support as mentioned earlier in this document.

**The battery indicator LED does not flash green, even though the power adapter is connected and plugged into a wall socket.**

- Ensure that the small end of the power adapter is firmly plugged into the unit's power port.
- Ensure that the outlet has power and is not malfunctioning. If the outlet is connected to a wall switch, make sure the switch is on.

**The battery is not charging.**

- Use the **supplied** power adapter to charge the unit. A USB port does not provide enough power to charge the unit.

- Make sure the small end of the power adapter is firmly plugged into the unit's power port.
- Ensure that the outlet has power and is not malfunctioning. If the outlet is connected to a wall switch, make sure the switch is on.

### **There are smudges or blemishes on the screen.**

- Clean the LCD screen as described in **Cleaning Procedures** on page 46.

### **The image is too small or too large on the screen.**

- Press the yellow **Magnification** buttons to increase or decrease magnification. For live images, press and HOLD a magnification button for continuous zoom magnification. For frozen or saved images, press a magnification button to zoom in or out one step at a time.

## **LED lights produce glare against a reflective surface.**

- Press and HOLD the green/yellow **Power** button, and then press the red **Freeze Frame** button to turn off the LED lights.

## **The unit turns off after 30 minutes.**

- This is expected behavior. The unit turns off after 30 minutes if no buttons are pressed. This extends battery life.

## Technical Specifications

- **LCD widescreen:** 5 inches / 127 mm; tilts approximately 40 degrees when viewing stand is open
- **Body size:**  
5.5 inches high / 139.7 mm  
3.5 inches wide / 88.9 mm  
0.8 inches deep / 20.3 mm
- **Weight:** 10.5 oz. / 298 grams
- **Color modes:** Full Color and Grayscale
- **Magnification range:** 2x to 14x continuous zoom
- **Image storage:** 100 MB of storage. Saved images are uncompressed bitmaps and range in size from 14,763 KB for images captured at lowest magnification to 381 KB for images captured at highest magnification.

- **Camera:** 5 MP HD auto-focus camera module
- **Screen resolution:** 800 x 480 pixels
- **Saved image resolution:** Varies based on magnification level and ranges from 2592 x 1944 pixels at lowest magnification to 416 x 312 pixels at highest magnification
- **Color:** 24-bit
- **Battery:** Li-ion battery; approximately 3 hours of continuous use; charges in approximately 3 hours

**Note:** Only use the supplied power adapter to charge the unit's battery.

## Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Reorient or relocate the receiving antenna.
- Consult the dealer or an experienced radio or television technician for help.

## Industry Canada Notice

- This Class B digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

## Regulatory Compliance

- **Safety:** IEC 60950-1 ed2.0, UL 60950-1:2007, CSA C22.2.60950-1:2007, EN 60950-1:2006 + A11:2009 + A1:2010 + A12:20122
- **EMC:** FCC (CFR-47, part 15) Class B; ICES-003; EN 55022 Class B; EN 55024



**Class 1 LED Product**

## Safety and Maintenance

- Do not attempt to repair the unit or open its case. This product contains no user serviceable parts. Any unauthorized attempt to service or replace internal components will void the product warranty.
- Do not remove the battery. It is not user serviceable.
- Keep the unit away from wet areas, rain, and other sources of liquids. Do not submerge the unit.
- Always operate the unit in a place where the temperature is between 10° and 35° C (50° and 95° F).
- Do not store in places subject to temperature extremes such as a parked car.
- Do not force any connector into the unit's power port. The power connector fits easily into the port.

## Cleaning the LCD Screen

- Turn off and unplug the unit before cleaning the LCD screen.
- Always use a clean microfiber cloth.
- Very gently wipe the cloth across the screen. **Do not** press hard on the cloth or screen.
- If you use a cleaning liquid, use an appropriate LCD cleaning liquid. You can also use distilled water, isopropyl alcohol, or vinegar mixed with water at a concentration of no more than 10 percent vinegar. Note that tap or mineral water may cause spotting on the screen. Do not leave any liquid on the screen. Repeat this procedure for hard to remove smudges.
- **Do not** spray any cleaning solutions directly on the LCD screen.
- **Do not** use a cleanser that contains acetone, ethyl alcohol, ethyl acid, ammonia, or methyl chloride.
- **Do not** use a paper towel to clean the LCD screen.

## Cleaning the PKMag 50 Body

- Make sure the unit is unplugged. Use a lightly dampened, soft, clean cloth with water or mild detergent. Do not use alcohol, solvents, abrasives, or aerosol sprays.