

# **Hawkeye V3 Video Borescope**

## **User Manual**



**Gradient Lens Corporation  
207 Tremont Street  
Rochester, NY 14608 USA**

**<http://www.gradientlens.com>  
585-235-2620**

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# Safety Information

## General Warnings

The following warning statements apply to use of the system in general. Warning statements that apply to specific procedures appear in the corresponding sections of the manual.



Do not allow the conductive insertion tube, system or its working tools to come in direct contact with any voltage or current source. Prevent all contact with live electrical conductors or terminals. Damage to the equipment and/or electrical shock to the operator may result.



Do not use this system in explosive environments.



**USE PROPERLY.** Using any piece of this equipment in a manner not specified by the manufacturer may impair the product's ability to protect the user from harm.

## General Cautions

The following caution statements apply to use of the Hawkeye V3 Videoscope device in general. Caution statements that apply specifically to particular procedures appear in the corresponding sections of the manual.



**HANDLE PROBE CAREFULLY.** Keep the insertion tube away from sharp objects that might penetrate its outer sheath. Keep the whole insertion tube as straight as possible during operation; loops or bends anywhere in the tube decrease its ability to steer the probe tip. Avoid bending the insertion tube sharply.

**Note:** Always use the Home button to straighten the bending neck before withdrawing insertion tube from inspection area or putting probe away. Never pull, twist, or straighten the bending neck by hand; internal damage may result. At the first sign of damage, return the probe for repair.

Certain substances may damage the probe. For a list of substances that are safe for the probe, see “Chemical Compatibility” in the Appendix.

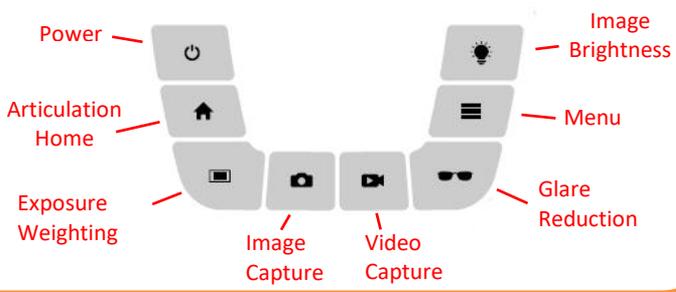
# Getting started - Hawkeye® V3

## V3 - Main Parts:

**WARNING:** The V3 Insertion Tube is electrically conductive. Do NOT allow contact with sources of electrical current. Operator injury or death could result.

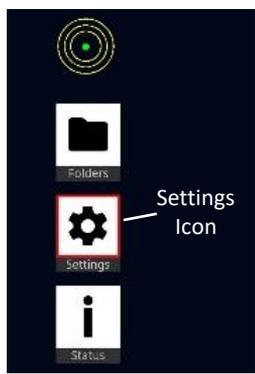


## Keypad Layout



## Main Menu & User Manual

Press Menu button for 1 sec to turn on.  
Press Settings icon to go to settings.  
Press User Manual icon for on-screen help.



### Battery Removal & Replacement

Remove battery by releasing Latch and sliding battery straight UP.



Replace battery by sliding into its mount straight DOWN. Push firmly on the top of the battery as shown to ensure the latch snaps into place.



### Check Battery Charge

Push the button on the Battery Status Indicator to show the state of Battery charge.  
3 lights = Full Charge  
2 lights = 60% Charge  
1 light = 30% Charge



### Fold-Out Stand

Pull stand out until it locks in place. Push back to store.



Lift the Port Cover to gain access to the ports.



Port Cover

Audio: Record notes with mic/headset.

Mini-USB: Download saved still or video files to computer.

USB 2: Attach flash drive.

HDMI: Output to monitor.



### Bench-Top Tripod Support

**CAUTION: The Tripod must NOT be used as the sole support for the V3. It is intended for bench-top use with the battery of the V3 resting on the bench.**

Remove the quick-release plate from the Tripod clamp and install it onto the back of the V3 as shown.



Place the Tripod on a flat surface with the quick-release plate on the V3 engaged in the quick-release clamp on the tripod. Tighten the clamp. Adjust the tripod head so the V3 is supported by the Battery case



## Support Strap System

The Support Strap System consists of two parts: The Neck Strap and the Belt.

Neck Strap



Belt

Attach the neck strap to the threaded socket on the back of the V3 as shown here.



Fasten the Belt around the waist and place the Neck Strap around the neck. The battery of the V3 rests in the pouch of the Belt. Adjust strap and belt lengths as needed.

## WiFi Password

WiFi password is: Password2\$

To change WiFi-connected device, disconnect current device and wait 1 full minute before connecting new device.

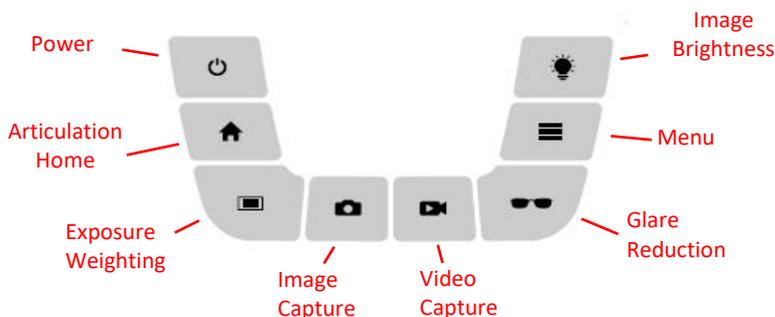
## Operation Overview

The Hawkeye V3 Videoscope is controlled via the Keypad, Joystick and Touch Screen. The Graphical User Interface (GUI) is accessed using the Keypad, and selections are made using the Joystick or the Touch Screen. These controls allow the user to:

- \* Articulate the tip of the flexible insertion tube to change the direction of view.
- \* Capture video and still images, and view them.
- \* Change image brightness and metering options.
- \* Select where images and videos are stored.
- \* Choose which status icons are displayed on the live screen, and how some of them operate.
- \* Control text overlays that are displayed on the live screen and saved with images and videos.
- \* Add notes and graphic annotations to saved images.
- \* Record audio notes.
- \* Output the screen to an iPhone or iPad via WiFi.
- \* Output stored images and videos to a computer via USB.

## Keypad

Starting in the upper left and moving counterclockwise the keypad buttons are Power, Articulation Home, Exposure Weighting, Image Capture, Video Capture, Glare Reduction, Menu and Image Brightness.



The Joystick in the middle of the keypad buttons is used to control tip articulation when in Live Screen mode and to move between icons when in Menu mode. Pressing down on the Joystick to click captures an image when in Live Screen mode and selects the highlighted icon when in Menu mode.

In Live Screen mode, a two-finger pinch expression on the Touch Screen can zoom the image.

In Menu mode, pressing the Touch Screen selects an icon or allows typing on the virtual keyboard.

## Power Up

To power ON the Hawkeye V3 Videoscope, press and hold the Power button for about 1 second. (Power OFF by holding it down for about 2 seconds.) The Hawkeye V3 will display a boot screen and the battery status LEDs will light for a few seconds while the system software is loaded. When this is complete, the Hawkeye V3 will start to display a live image. If this is the first time you have powered ON the Hawkeye V3, the display will include a bullseye indicator for articulation position at the upper left of the display.



## Insertion Tube

**The insertion tube of the Hawkeye V3 Videoscope should be uncoiled before you begin moving the Joystick to articulate the Insertion Tube tip.**

Avoid forcing the Insertion Tube to bend too sharply. As the Insertion Tube tip is articulated via the Joystick, the live image will pan and the green dot in the articulation icon will move to indicate the articulation amount and direction.

Carefully guide the tip of the Insertion Tube to the location you want to view. Use the Joystick to look in different directions.



**Reminder** - Always use the Home button to straighten the bending neck before withdrawing Insertion Tube from the inspection area.



## Live Screen

The default starting live screen has an Articulation Indicator at the upper left (lower left if Text Overlay is placed there). Orange bars appear when near the end of travel in the noted direction. Status Indicators appear along the right edge if activated. If the USB Flash Drive is installed, a USB Eject icon  displays near the top right. Before removing the USB Flash Drive, be sure to press the eject icon to properly close it and avoid data loss.



## Exposure Weighting

The exposure metering mode may be stepped through three settings with this button: Average, Center Weighted, and Edge Weighted.



## Capturing Images

While viewing a live image, a still image may be captured by pressing the Image Capture button, or by pushing straight down on the Joystick until it clicks.



## Capturing Videos

A video may be captured by pressing the Video Capture button. A red dot will appear at the upper-right corner of the screen when recording. Stop recording by pressing the button again. A still image may be captured at any time during video recording by pushing the Image Capture button or clicking the Joystick without interrupting the video recording.



## Glare Reduction

Highly reflective objects may produce unwanted glare in the image. Pressing the Glare Reduction button will step through three levels of glare reduction that may improve image quality.



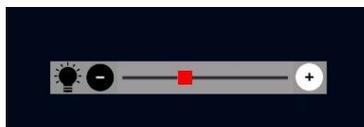
## Menu

Pressing the Menu button displays the main menu screen where many settings and features of the V3 may be modified.



## Image Brightness

Image illumination may be adjusted by pressing the Image Illumination button. This brings up a horizontal scroll bar which can be adjusted via the Touch Screen or the Joystick.



## Main Menu

Pressing the Menu Button displays the Folders, Settings and Status icons below the Articulation Indicator. Pressing the Menu button again at any time will return to Live Screen mode.



Icons may be activated by pressing them on the Touch Screen or navigating to them with the Joystick and clicking the Joystick.

## Folders

Pressing the Folders icon opens the **File Manager**.



## File Manager

The **File Manager** allows you to choose where images and videos are stored, and allows you to navigate through the file systems in the Local and USB storage areas. The Local storage area is small and more difficult to work with than the USB storage, so we recommend always selecting the USB Flash drive for image and video storage.

Pressing a folder's icon on the touch screen opens that folder.

While any folder is open, a sub-folder may be created by pressing the Add Folder icon in the lower right corner of the screen.



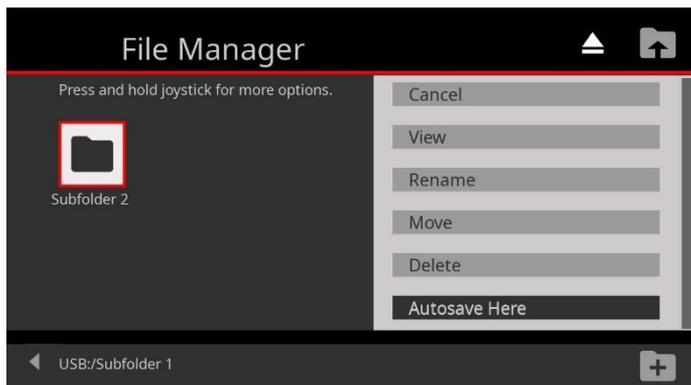
A virtual keyboard will appear, allowing you to name the new sub-folder.



Pressing the up-one-level icon in the upper right lets you navigate up one folder level.

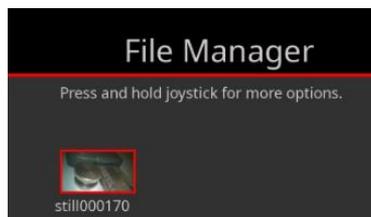


Pressing and holding the folder icon or the Joystick while a folder is selected opens a menu that allows options for renaming, moving, deleting or setting that folder as the Autosave location.



## Image Viewer

Touching an image or navigating to it with the joystick and clicking the joystick opens it in the Image Viewer.



Opening a still image displays the image along with options to delete the image or add notes.



Touching the still image on the screen or selecting and clicking it with the Joystick opens a full-screen view of



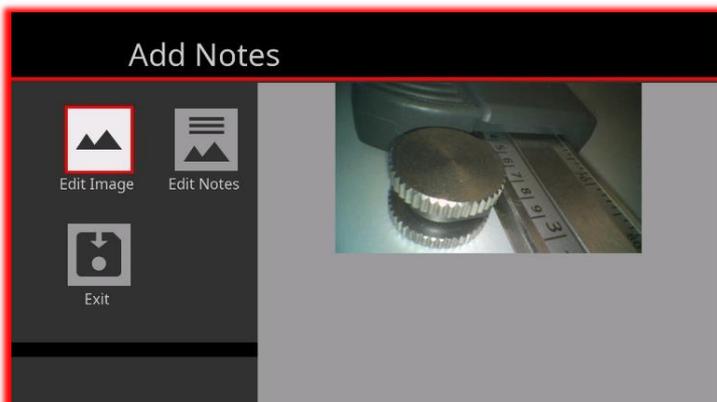
the image. Touching it or clicking on it again returns to the previous screen.

### **Add Notes**

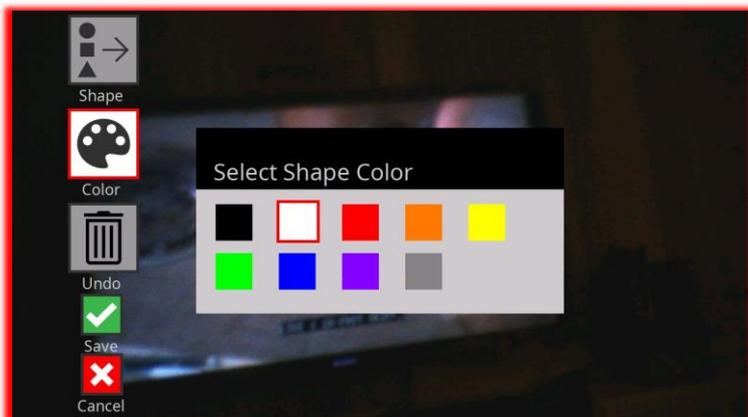
Add Notes creates a DOCX version of the image that can be opened as a Microsoft Word document to view on a computer. The original image is not altered. If you exit without doing anything, no extra document is created.

## Edit Image

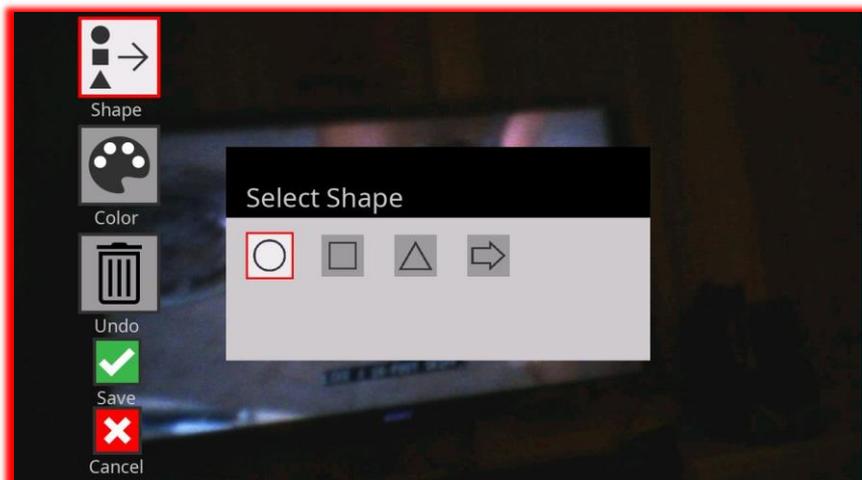
Under Add Notes there are choices to Edit Image or Edit Notes. Edit Image allows you to add outline shapes to the image to highlight an area of interest. Select the image shape and draw it using the touch screen. You can select what color the next shape will be and you can Undo the last few shapes drawn. Click Save to add the shape to the DOCX notes file or Cancel to make no changes.



Set next shape color:



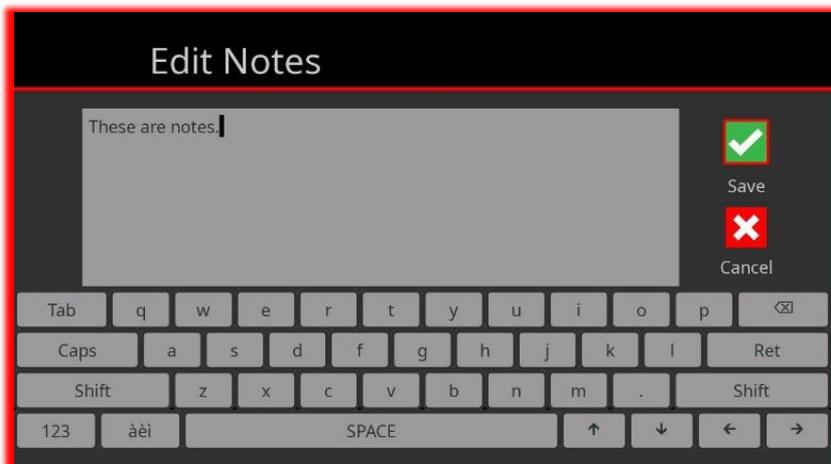
Select shape:



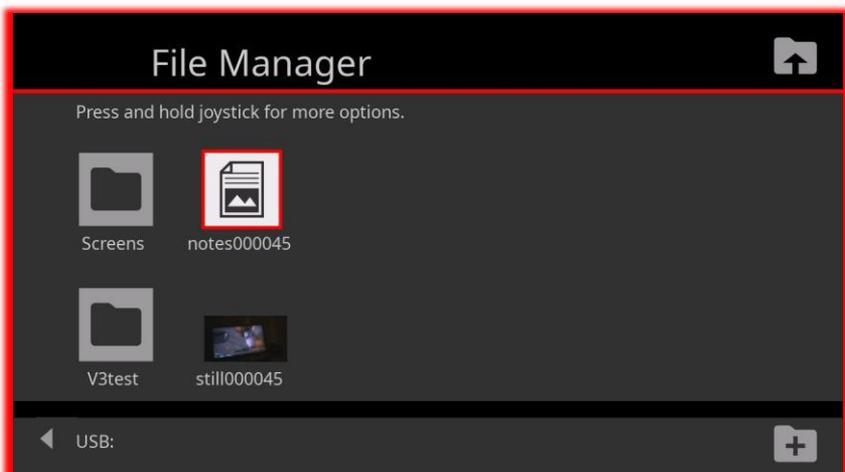
Apply shape to image:



## Edit Notes

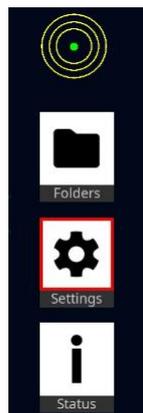


Selecting Edit Notes displays a virtual keyboard where you may enter text. A notesxxxxxx.docx file which contains a copy of image with the shapes and the notes text you entered is created and can be viewed on the V3 or copied to a computer and viewed with Microsoft Word or other docx compatible viewer.



## Settings

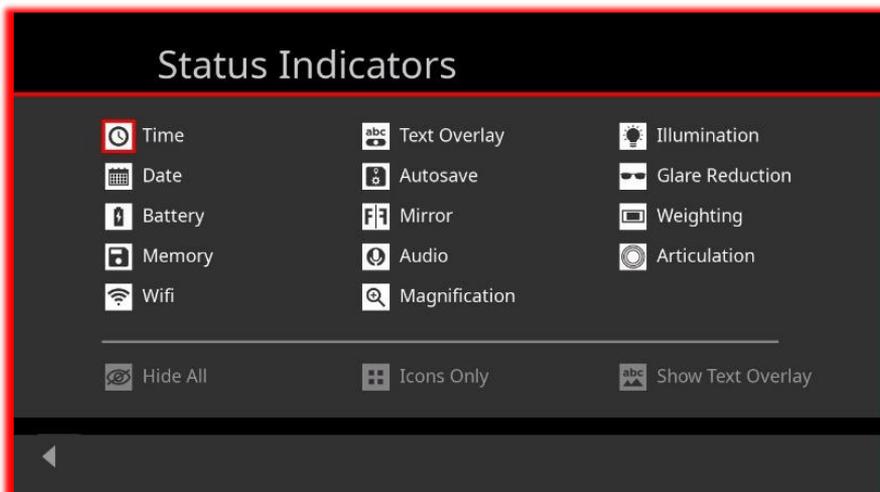
Activating the Settings icon on the main menu opens the Settings screen which offers a number of options, including Status Indicators to control what is displayed on the live screen, Text Overlay to add text to captured images and/or the live screen, Mirror image, AutoSave location, PowerSave mode delay time and more.



## Status Indicators



The Status Indicator screen allows you to quickly choose which Status Indicators that have been activated are displayed on the live screen. It is divided into two parts. The icons above the horizontal line represent individual status indicators. Those icons which are highlighted will be displayed. Touch the items to toggle between highlighted and grayed.



The icons below the line control groups of display items. When selected:

**Hide All** will hide all the status indicators on the live screen. Otherwise the set you have selected will be displayed.

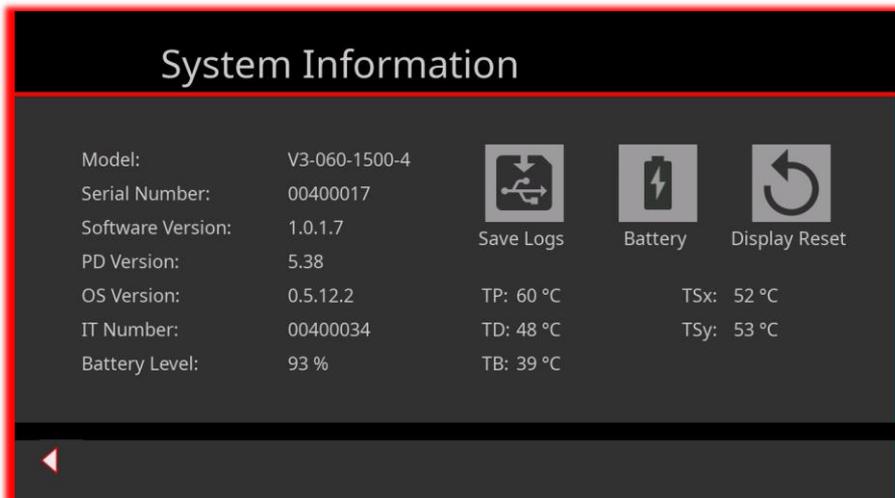
**Icons Only** will remove the text from active status indicators and show only the icons to save live display space.

**Show Text Overlay** will turn the selected text overlay items on or off on the live screen. When active, the items will be highlighted.

## System Information



The System Information screen shows important device information, such as Model, Serial Number, software versions, internal component temperatures and detailed Battery status.



## Text Overlay



The Text Overlay screen allows you to configure text overlays that will be shown on the live screen and saved as part of the image. Going across the top row, left to right, the highlighted icon determines whether the text overlay is displayed, whether the Text Overlay status icon is displayed on the live screen and if time and date are included. In the second row selects which of the 20 user defined text strings is displayed, the display color and where on the image it is placed. In the 3<sup>rd</sup> row, controls the grid, the grid color and displays a preview.



## Powersave

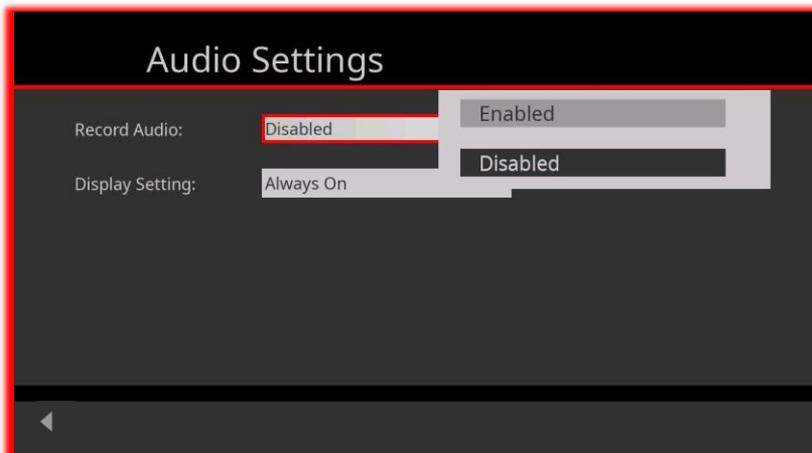
Powersave lets you control how long the V3 remains idle before going to sleep or powering off to conserve battery charge.



## Audio Settings



You may Enable or Disable the recording of audio along with your videos. An external microphone plugged into the audio port in the side of the V3 is required. When the Audio status indicator is set to Always On, the icon on the live screen can be touched to quickly go to this screen, if you want to frequently turn audio recording on and off.



## Autosave

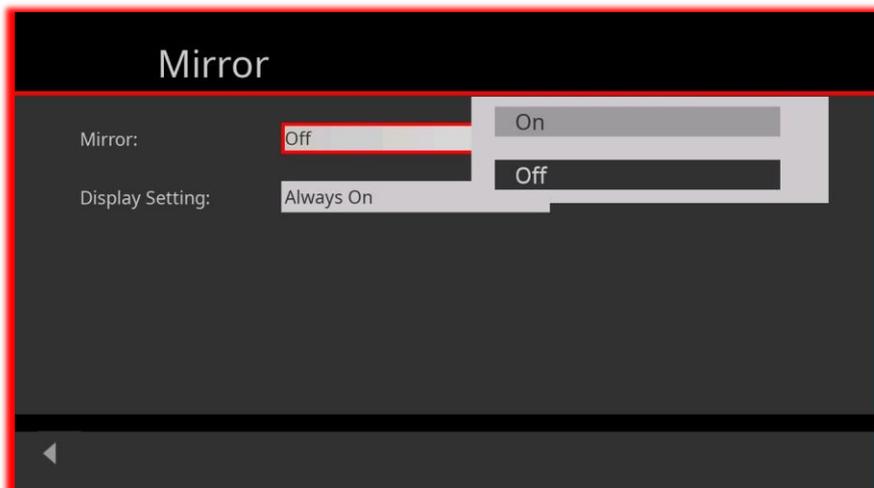


When set to Full Autosave On images are automatically saved to the chosen Autosave location, which can be internal Local storage or preferably an inserted USB Flash drive. Folders can be created and named as desired, then selected as the Autosave location for images and videos. When Location Only is chosen captured images are displayed for inspection and may be deleted before saving in the Autosave location. When Autosave Off is chosen images are displayed for inspection and save location must be chosen for each image.



## Mirror

The display can be set to mirror left to right if desired and the Mirror status indicator can be set to display on the live screen Always, Never or When Active.



## WiFi Setup



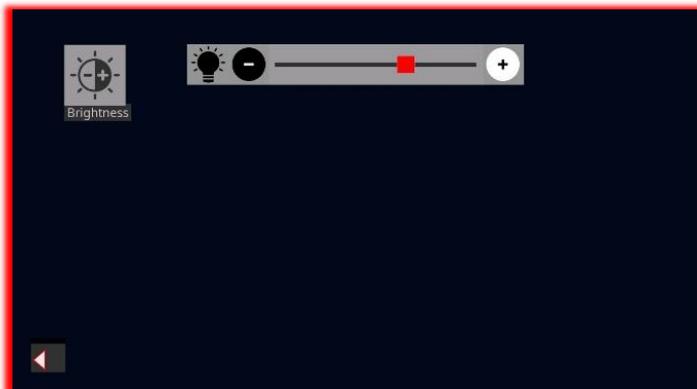
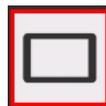
Controls the WiFi screen mirroring to a WiFi connected Apple iPhone™ or Apple iPad™ using the V3 View app that can be downloaded from the Apple App Store™. The V3 View app will ask you to select the V3 device to connect with and then display the video stream from the Hawkeye V3. The WiFi password for the V3 is “Password2\$”, without quotation marks. Images can be captured, and video saved into Photos from the Hawkeye V3 View app. From there they can be texted or sent in an email as you would any other image or video.

A screenshot of the 'Wifi Setup' screen from the V3 View app. The screen has a dark background with white text and light gray input fields. At the top, the title 'Wifi Setup' is centered. Below it are five rows of settings, each with a label on the left and an input field on the right. The 'Wifi Mode' field is highlighted with a red border. At the bottom left, there is a white back arrow icon.

Wifi Setup	
Wifi Mode:	Broadcast
SSID:	V3View0000
IP Address:	192.168.8.126
Port:	10643
Display Setting:	On When Active

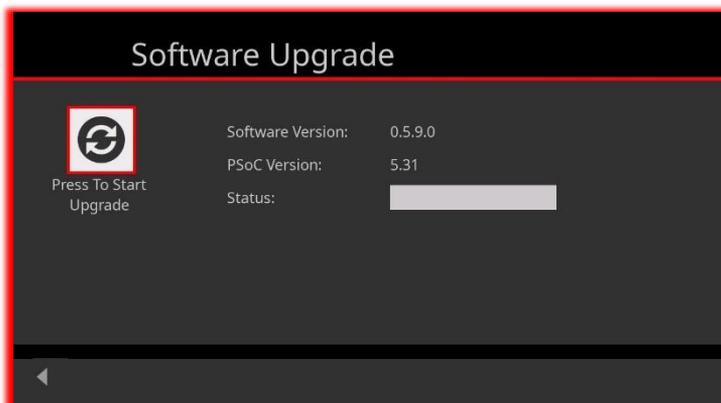
## Screen Brightness

The screen backlight brightness can be changed for optimal viewing in a dark room or outdoors.



## Software Upgrade

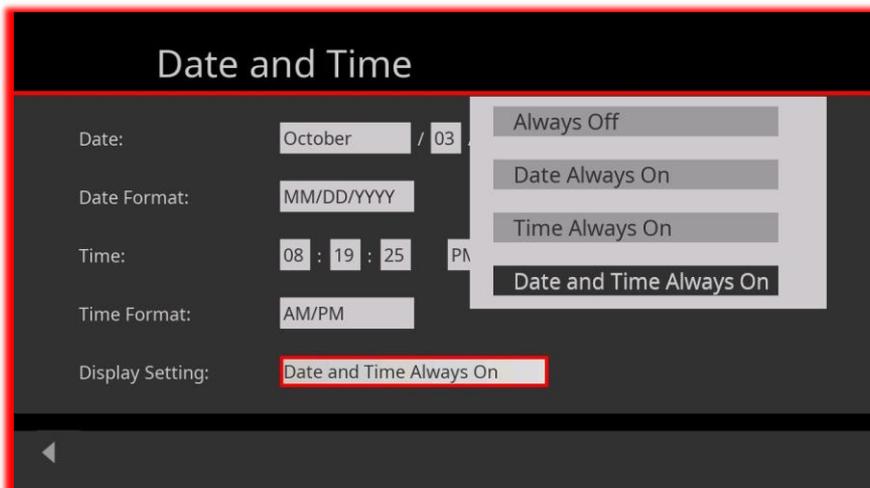
The Software Upgrade screen is provided for the future installation of revised system files should that become necessary.



## Date and Time



The Date and Time screen allows setting the system date and time, which are preserved during main battery removal. You can also choose whether the date and time are displayed on the live screen.



## User Manual

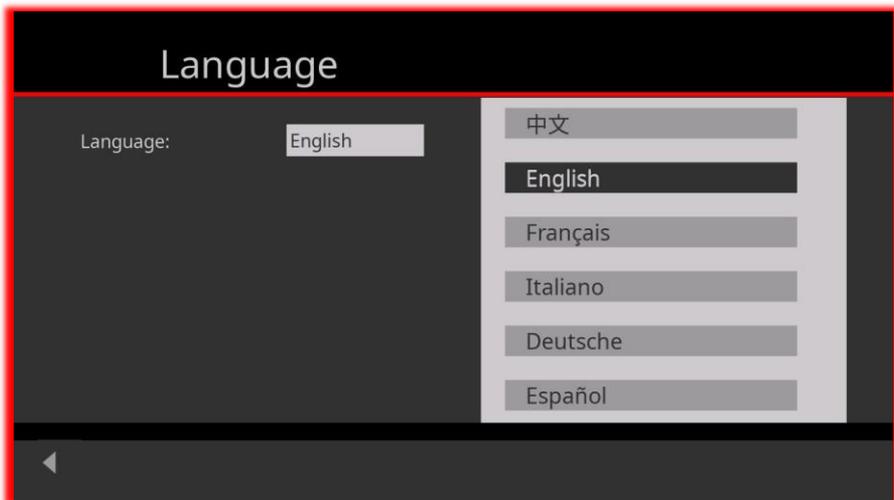


An abbreviated, beta version of this user guide is accessible by activating this icon.

## Language



A number of languages can be set in the Hawkeye V3, so that most text will display in the selected language.



## V3 Disk Mode



Selecting this option while the V3 has a USB connection to a computer will mount the V3 as an external drive. Images and files stored in the Local folder of the V3 will then be accessible for downloading to the computer. (Note: The USB flash drive is NOT accessible this way.)

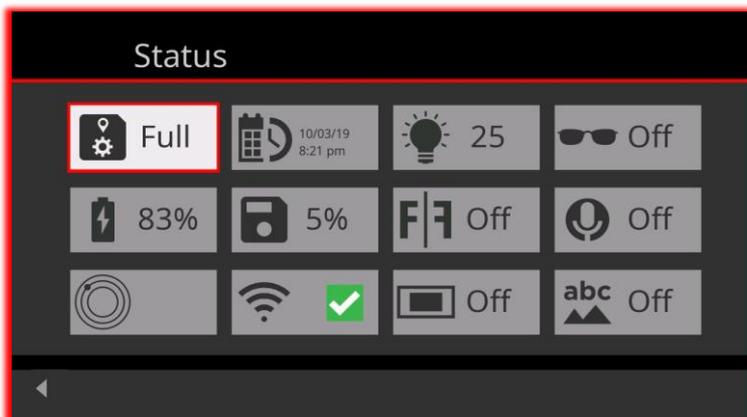
The USB cable requires a Mini B connector on the V3 end of the cable, such as the one pictured here. It connects to USB Port 1 under the Port Cover at the side of the V3 display.



## Status

Selecting the Status icon on the main menu allows the user to choose which Status Indicators are active and their mode of display, if applicable. Many other settings of the functions shown here are accessible from this screen as well as from the Settings icon

 on the Main Menu.



### Autosave On/Off and Location



Status Indicator may be set to Always On or Always Off. Other parameters can be set here, as well as from the Settings icon. 

### Date & Time



Date and time may be set to display Always or Never, individually or as a pair. Date and time can be set here as well.

## Luminance



Status Indicator may be set to Always On, Always Off or On When Active.

The setting may be changed here. This adjusts the overall brightness of the live camera image.

## Glare Reduction



Status indicator choices are Always On, Always Off or On When Active. Current glare reduction level is displayed and can be changed. The glare reduction levels may also be changed by pressing the Glare Reduction button on the Keypad.



## Battery



Status Indicator may be set to Always On or Warning Only - to display only when battery is near discharged. Also displays current battery charge level and other battery performance parameters.

## Memory



Status Indicator may be set to Always On or Warning Only – when memory is approaching full.

## Mirror



Displays the status of the Mirror function. This function may be toggled on/off here as well as from the Settings screen.

## Audio Recording



Status indicator choices are Always On, Always Off or On When Active.

Audio Recording may be enabled or disabled here as well as from the Settings screen.

## Articulation Status



Status Indicator choices are Always On and Warning Only – when the Insertion Tube tip is articulated to an extreme.

## WiFi Status



Status Indicator choices are Always Off and On When Active. Other WiFi setup parameters are available here as well as from the Settings screen.

## Exposure Weighting



Status indicator choices are Always On, Always Off or On When Active.

The Exposure Weighting mode can be set here as well as by using the Exposure Weighting button  on the keypad.

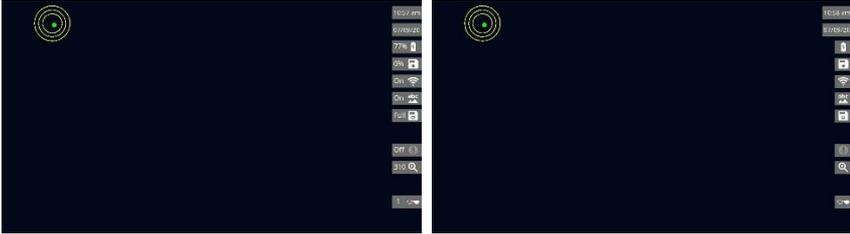
## Text Overlay



The Text Overlay may be turned on and off, and its other parameters set from here as well as from the Settings screen.

## Display Customization

Most of the Status Indicators will appear in a column at the right edge of the live screen if activated and selected for display by the user, as described above.



The Articulation Status Indicator will appear at the upper left corner of the live screen if active.

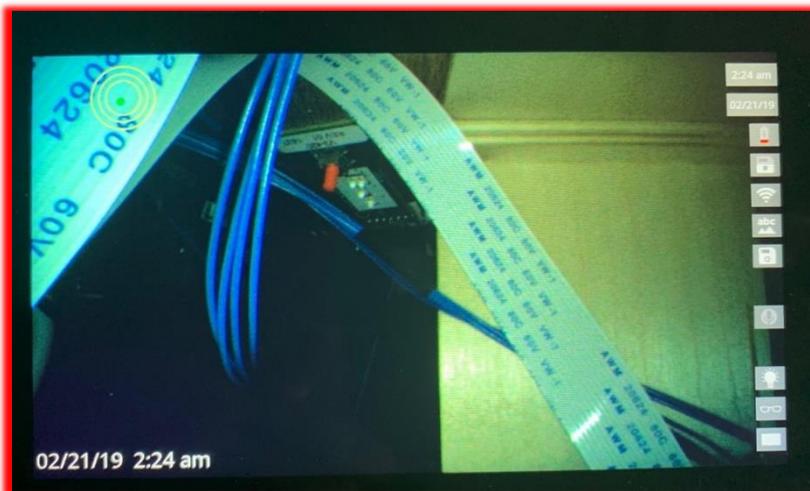
Any Text Overlay that is active can be positioned on the live screen by the user via the Text Overlay buttons found on the Settings screen  or the Status screen. 

When the display mode of an indicator is set to On, the Status Indicator icon is displayed on the live screen all the time.

When the display mode of a Status Indicator is set to Off, the icon for that feature will only display on the live screen when it is indicating an error condition. For example, if the battery Status Indicator display mode is set to Off, it will not appear on the live display. But, if the battery is getting low, the battery Status Indicator will appear to warn you to take action, such as homing the insertion tube and withdrawing it before power becomes too low to home and the insertion tube can't be withdrawn without risking damage.

When the display mode is set to On When Active, the status icon only appears on the live screen when the feature is active.

Here is the live display with Text Overlay showing date & time in lower left, Articulation Display bullseye in the upper left and most of the Status Icons displayed in Icon Only mode.



Here the display icons are shown with Icon Only turned off.



## Pinch-to-Zoom Magnification

The live screen image may be magnified by up to 5X by touching the screen with two fingers simultaneously and spreading them apart. The zoomed-in image may be reduced by applying two fingers to the Touch Screen at separated points and moving them closer together, using a 'pinching' gesture.

When the live screen image is magnified, the magnification Status Indicator will appear if it is set to display. If Icons Only mode is OFF, the magnification Status Indicator will display the degree of magnification as a percentage, with 100 indicating 1:1 magnification.



## Accessories

### 90° Prism Tip

The 90° Prism Tip allows viewing 'to the side' of the Insertion Tube axis, rather than the normal straight-ahead direction of view.

To install the Prism Tip, first remove the protective Tip Cap by unscrewing it. Note that there are two sets of threads on the tip of the Insertion Tube.



Now thread on the Prism Tip by rotating the knurled part. After the first set of threads is passed, the Prism Tip will slide a little bit before engaging the second set of threads. The end of the Prism Tip may need to be rotated to allow the internal locating surfaces to engage, allowing the knurled portion to continue threading onto the tip until resistance is felt. When properly mounted, the end of the Prism Tip will not be able to rotate, and there will be a small gap between the end of the knurled portion and the shoulder machined into the tip of the Insertion Tube.



## Close-Up Tip

The Close-Up Tip installs the same way as the 90° Prism Tip described above.



## Maintenance

### Cleaning the System

Clean the exterior of the Hawkeye V3 with a soft, damp cloth. Clean the optical surfaces at the tip, as well as the Touch Screen with the supplied lens cleaning solution, or a commercial glass cleaner. Use a soft, non-scratching cloth or the included cotton swabs or equivalent. Do NOT use strong solvents such as acetone on the V3.



## Chemical Compatibility

Chemical compatibility refers to the probe's ability to come into contact with various liquid substances for short periods and not be damaged.

**WARNING** Do not use this system in explosive environments.

These substances are safe for a short duration of contact with the insertion tube:

- Water
- Aircraft Gasoline
- Jet-A-Fuel
- Isopropyl alcohol
- JP-4Fuel
- Kerosene
- Synthetic Turbo Oil
- Gasoline
- Diesel Fuel
- Hydraulic Oil
- Inhibited Transformer Oil

After contact with the above fluids, the insertion tube must be cleaned using soap and water and then dried prior to returning to the case for storage. The foam in the storage case is not compatible with these chemicals.

## Sales and Technical Support

### Gradient Lens Corporation

207 Tremont Street  
Rochester, NY 14608  
Phone: 585-235-2620

Gradientlens.com

[info@gradientlens.com](mailto:info@gradientlens.com)

Toll Free: 800-536-0790

### Gradient Lens Corporation West

4647 Jackson Lane, Unit D  
Phelan, CA 92371  
Phone: 760-868-5812

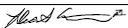
## Service

To obtain service for a Hawkeye V3 Video Borescope, please contact your reseller or Gradient Lens Corporation directly. If the problem cannot be corrected over the phone, a Return Materials Authorization number (RMA) will be given along with instructions for shipment to an authorized service center.

## Warranty

Gradient Lens Corporation warrants that all Hawkeye borescopes and accessories will be free of defects in materials and workmanship for one year from the date of first retail purchase. Video and lighting products have manufacturer's warranties for one year. This warranty does not cover breakage or failure due to tampering, misuse, neglect, accidents, improper installation, modification, shipping, or to improper maintenance, service and cleaning procedures. This warranty is also void if the instrument is not used in accordance with the manufacturer recommendations or if required service is performed by anyone other than a Gradient Lens Corporation authorized agent. NO OTHER EXPRESS OR IMPLIED WARRANTY IS GIVEN.

## Certifications / Compliance

<b>DECLARATION OF CONFORMITY</b>	
Application of Council Directive: 2014/35/EU	
Standards to which conformity is declared:	IEC61010-1:2010
Manufacturer's Name:	Gradient Lens Corporation
Manufacturer's Address:	207 Tremont Street Rochester, NY 14608
Equipment Description:	Borescope
Equipment Class:	Class II
Model Number:	V3-060-3000-4, V3-040-1500-4, V3-040-3000-4, V3-060-1500-4, V3-060-3000-4, V3-060-6000-4, V3-060-8000-4
I the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).	
Place:	Rochester, NY USA
Signature:	
Full Name:	Leland Atkinson
Position:	Vice President

### FCC Statement / CAN ICES-3 (A) / NMB-3(A)

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of FCC Rules. 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.