



E-SERIES VIDEO BORESCOPE

User's Manual



VES-020-XXXX-X
VES-028-XXXX-X

General Warnings: The following warning statements apply to use of the Hawkeye® E-Series Video Borescope 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.



DO NOT use this system on people or animals.



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® E-Series Video Borescope in general. Caution statements that apply to specific procedures appear in the corresponding sections of the manual.



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



ALWAYS uncoil the insertion tube before moving the joystick to articulate the bending neck.



ALWAYS use the joystick to straighten the bending neck before withdrawing the insertion tube from the inspection area or putting the 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.



NEVER force the insertion tube to bend too sharply. Carefully guide the tip of the insertion tube to the location you want to view. Use the joystick to look in different directions.



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

Operation Overview: The Hawkeye® E-Series Videoscope is controlled via the keypad, joystick, and trigger.









The graphical user interface is accessed using the keypad. These controls allow the user to:


- Articulate the tip of the flexible insertion tube to change the direction of view.
- Rotate Live-View image.
- Adjust lighting.
- Capture video and still images to a TF/microSD card.
- Play back captured video and images.
- Adjust system settings.


The Joystick in the middle of the keypad buttons is used to control tip articulation when in Live-View mode.



Interface Layout:



Button	Name	Live-View Mode	Playback Mode	System Menu
	Power	Power On/Off Image Freeze/Unfreeze	Power On/Off	
	Up Arrow	Image Rotation	Menu Navigation	
	Return/Playback	Enter Playback Mode	Return	
	Menu/OK	Enter Settings Menu	Confirm	
	Down Arrow Photo/Video	Photo/Video Selector	Menu Navigation	
	LED Brightness	Adjust LED Intensity	N/A	
	Joystick	Control Probe Tip Direction		
	Trigger	Capture Image/Video	N/A	

Power On: Press and hold the  button for 3 seconds. A blue light on the upper left corner will light, and the system will power on. Live-View is the default mode. In this mode, the user can observe the image captured by the camera on the display. The joystick controls the movement and direction of the front camera.

Power Off: Press and hold the  button for 2 seconds. The device will store data then power off.

Lighting: The  button will adjust the brightness of the LED illumination. The brightness is adjustable in 7 levels. The LED icon  in the upper right corner of the screen displays the current brightness level. Brightness adjustments can only be made in Live-View mode.




Freeze Frame: A short press of the  button will freeze the image on the screen. Press the  button again to release the freeze.

Image Rotation: In Live-View mode press the  button to rotate the live image clockwise in 90° intervals.





















Photo/Video Modes: The photo icon  will display in the upper left corner of the screen when the device powers on, indicating that the camera is currently in photo capture mode. To switch to video capture mode, press the  button on the control panel. The video icon  will now display indicating that the device is in video capture mode.

Image Capture: When the device is in photo capture mode, press the trigger  to capture a still image. When the device is in video capture mode, press the trigger  to start recording video. A timer will appear next to the video icon 00:00 indicating that video recording is in progress. To end video recording, press the trigger  again.

Playback/Delete: In Live-View press the  button to enter Play-Back mode. Photos and videos are stored separately. Use the   buttons to select photos or videos and confirm with the  button. Files are listed on the left side of the screen. The highlighted file's information will be displayed alongside a preview image. Navigate to the desired file with the   buttons. Confirm with the  button. The icons for play and delete will appear on the interface, and the current file can be viewed in full-screen or deleted. Use the   buttons to select play or delete. Confirm with the  button. If delete is chosen, a confirmation icon will appear. Use the   buttons to select cancel or delete. Confirm with the  button.


System Settings: In Live-View mode, press the  button to enter the system settings. The following system parameters can be set:

Image Zoom: The up arrow zooms in on the image, the down arrow zooms out. The number in the upper right corner of the screen (i.e., 1x) indicates the current zoom factor. Image ranges from 1x-4x in 10 steps.

Image Display: Choose from 3 image effects: Multicolor, Black & White, or Negative Film.

Reference line: Turn reference lines On or OFF.

Watermark of Time: Timestamp information on the bottom of the screen can be turned ON or OFF.

Image format: Select JPEG or BMP image storage formats.

Image Rollovers: Select from 0°, 90°, 180°, or 270° of image rotation.

Backlight Brightness: Screen brightness can be increased or decreased in 3 steps.

Time and Date: Set Date & Time. Date is in Year/Month/Day format. Time is in 24-hour format.

Display Language: English, Japanese, Korean, French, German, Portuguese, Spanish, Russian, Italian, Dutch, Polish, Simplified Chinese, Traditional Chinese.

Card Formatting: Format memory Card.



Unintentional formatting may cause unrecoverable data loss.


Restore Default Settings: Restore to default factory settings.

Firmware: Display firmware version and update firmware.

Ports: The Hawkeye® E-Series Video Borescope comes equipped with Mini HDMI, Micro USB, and TF/microSD ports.

HDMI: The Hawkeye® E-Series Video Borescope can be connected to an external monitor or television equipped with an HDMI port using the supplied Mini HDMI cable.

Micro USB: The Micro USB port is used as a charging port.

Charging: The battery level icon  in the upper right corner of the screen displays the current battery charge level. To charge the battery, connect the device to a power outlet using the supplied Micro USB cable and USB power adapter.



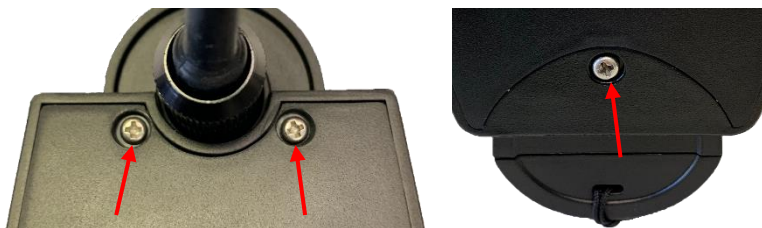
The Micro USB interface is for charging only. It does not have data transfer functionality.

TF/microSD: The microSD card is used to store and transfer media via the included microSD card adapter. To insert the card, hold the memory card with the arrow pointing toward the slot, and carefully slide it into the slot until it clicks into place. The memory card icon will appear in the upper right corner of the display.



DO NOT insert memory card in the wrong orientation. If you force it into the slot upside down or backwards, the slot may be damaged!

Stand Removal: To remove the magnetic table stand, remove 2 screws near the base of the insertion tube and 1 screw near the wrist strap with the supplied screwdriver. Lift the stand away from the videoscope.



Battery Removal & Replacement:

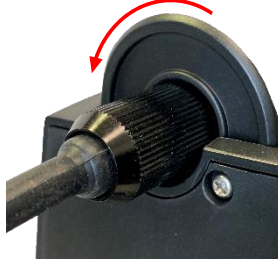
1. Remove magnetic table stand.
2. To open the battery compartment, remove the screw at the base of the battery cover, then lift from the base of the battery cover.



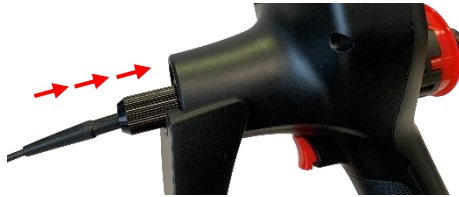
3. To reinstall the battery and magnetic table stand, reverse the steps.

Insertion Tube Removal:

1. Loosen the retaining nut at the base of the insertion tube by turning it in a counterclockwise direction.



2. Use the loosened retaining nut to gently push and separate the insertion tube from the main unit.



3. Remove the retaining nut from the insertion tube. Pull the insertion tube out the front of the main unit.

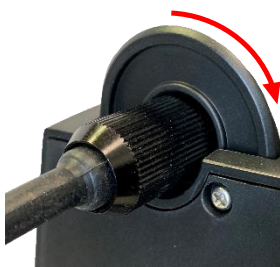


Insertion Tube Replacement:

1. Place the insertion tube into the opening of the main unit, ensuring that the arrow on the red bezel is oriented in the up position.



2. Replace the retaining nut and gently tighten by turning it in a clockwise direction.



Replacement insertion tubes compatible with your Hawkeye® E-Series Videoscope are available in a variety of lengths and diameters. Contact your reseller or Gradient Lens Corporation to learn more.

Troubleshooting:

1. Unit will not turn on:

→ Battery missing or the battery has been depleted.

✓ Charge or replace the battery. (pg. 8, 9)

2. Auto Shutdown:

→ Battery has been depleted.

✓ Charge or replace the battery. (pg. 8, 9)

3. Screen is Frozen:

→ The Freeze Frame feature has been activated.

✓ Short press the power button to release the freeze. (pg. 5)

→ System boot failure or battery depleted.

✓ Charge or replace the battery. (pg. 8, 9)

✓ Perform hard reset by removing then replacing the battery. Ensure battery is charged. (pg. 8, 9)

✓ Ensure that the insertion tube is properly seated, and that the retaining nut is secure. (pg. 11) ⚠ DO NOT over-tighten the retaining nut.

✓ Remove insertion tube and gently clean electronic contact points with alcohol and a clean Q-tip. (pg. 10)

4. Image or Video cannot be recorded or found:

→ TF / microSD card is full or missing.

✓ Replace card or delete files to make room for new images and videos. (pg. 6, 8)

Specifications:

	VES-020-XXXX-X	VES-028-XXXX-X
Diameter:	2.0mm (.078")	2.8mm (.110")
Length:	1m/2m/3m/4.5 m	1m/2m
Articulation:	150°±10° / 4.5m N/A	150°± 10°
Field of View:	100° Diagonal ±10°	
Depth of Field:	3mm - 50mm	
Direction of View:	0°	
Sheath:	Tungsten Wire	
Camera:	400x400px	
Display:	3.5" HD	
Illumination:	Tip LED	Integrated White LED
Interfaces:	HDMI, USB*, Micro-SD	
Battery:	4hr, 3.7V, 3200mAh	
Recording Formats:	JPEG / BMP, MPEG4	
Operating Temp.	Probe: -20°C to 60°C (-4°F to 140°F) Display Unit: -10° to +50°C (14°F to 122°F)	
Storage Temp.:	-20°C to 60°C (-4°F to 122°F)	
Weight:	Display Unit: 1.5 lbs. / Probe: Varies by length	
Environmental:	Insertion Tube: IP67	

*Micro USB interface is for charging only. It does not have data transfer functionality.

Chemical Compatibility: Chemical compatibility refers to the probe's ability to contact various liquid substances for short periods and not be damaged. The Hawkeye® E-Series Videoscope insertion tube is resistant to chemicals typically used in manufacturing environments. Please contact Gradient Lens Corporation directly if you have specific requirements.



WARNING: Do not use this system in explosive environments.

Sales & Technical Support:

Gradient Lens Corporation

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Phone: 760-868-5812

gradientlens.com

info@gradientlens.com

Toll Free: 800-536-0790

Service: To obtain service for a Hawkeye® E-Series Videoscope, 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 provided 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 a period of one year from the date of first retail purchase. Video and lighting products have manufacturer's warranties for a period of one year. This warranty does not cover breakage or failure due to tampering, misuse, neglect, accidents, improper installation, modification, shipping, or arising from 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.

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