

XL Vu™ VideoProbe®

Operating Manual



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About this Manual

This manual and the related equipment is intended for visual inspection technicians with a basic understanding of inspection principles and practices, and who are familiar with basic computer operations, but who may not have experience with a video borescope system.

The manual contains complete setup, operating, and maintenance instructions for the XL Vu video borescope system. The manual also provides a product overview, step-by-step procedures, and reference information.

To ensure operator safety, please read and understand this manual prior to using the system.

For additional assistance, go to www.geinspectionstechnologies.com for a complete listing of contact information.

Standard Corded Version

- XL Vu
- XL Vu Storage Case
- Optical Tip Storage Case
- 4 GB USB Thumbdrive
- Owner's Manual
- Quickstart Card
- Documentation CD-ROM
- Power Supply Brick

Standard Battery Version

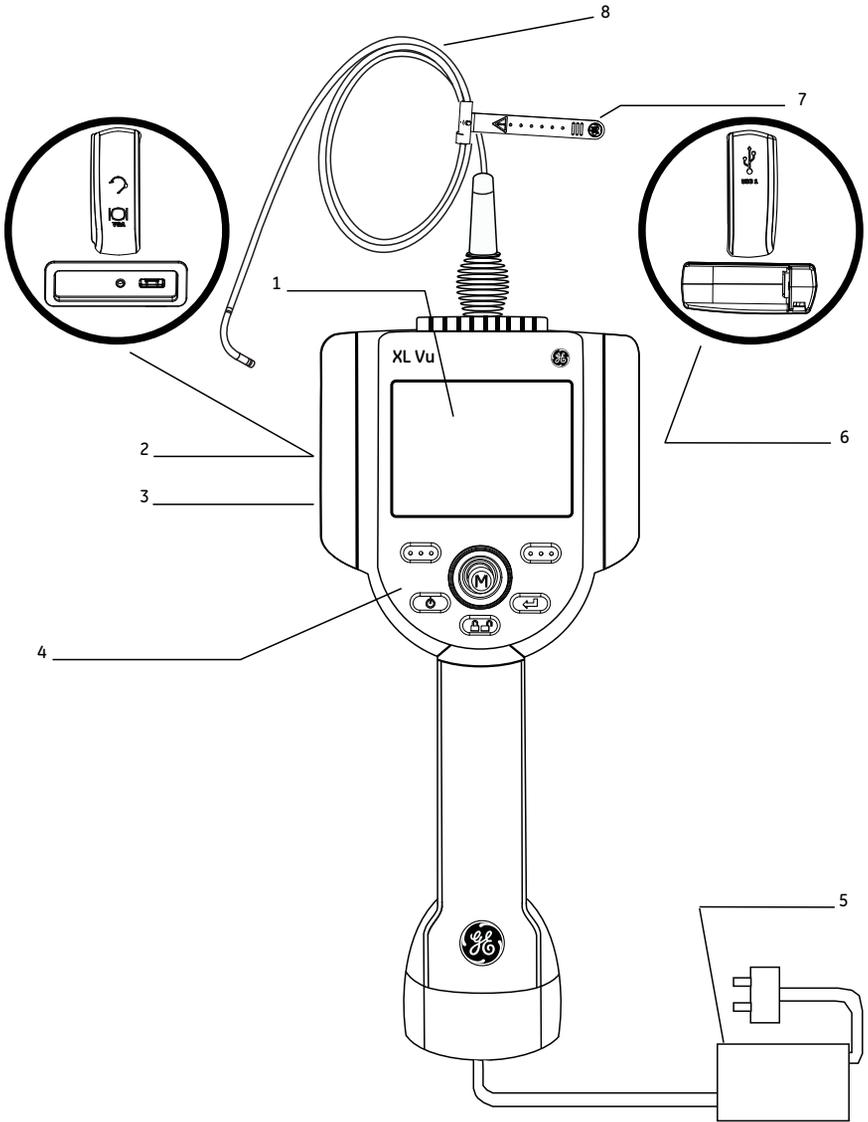
- XL Vu
- XL Vu Storage Case
- Optical Tip Storage Case
- 4 GB USB Thumbdrive
- Owner's Manual
- Quickstart Card
- Documentation CD-ROM
- 2-hour Li-Ion Battery
- AC Adapter/Battery Charger

Optional Accessories

- Headset
- VGA Video Cable
- IT Gripper
- IT Rigidizer
- Mini-Magic Arm
- Car Cord
- Handset Holder
- Soft Case
- Spare 4 hour battery (Battery Version Only)
- Neck Strap
- 16 GB USB Thumbdrive
- Belt Clip
- Sun Visor
- Mounting Kit

Introduction

Corded XL Vu

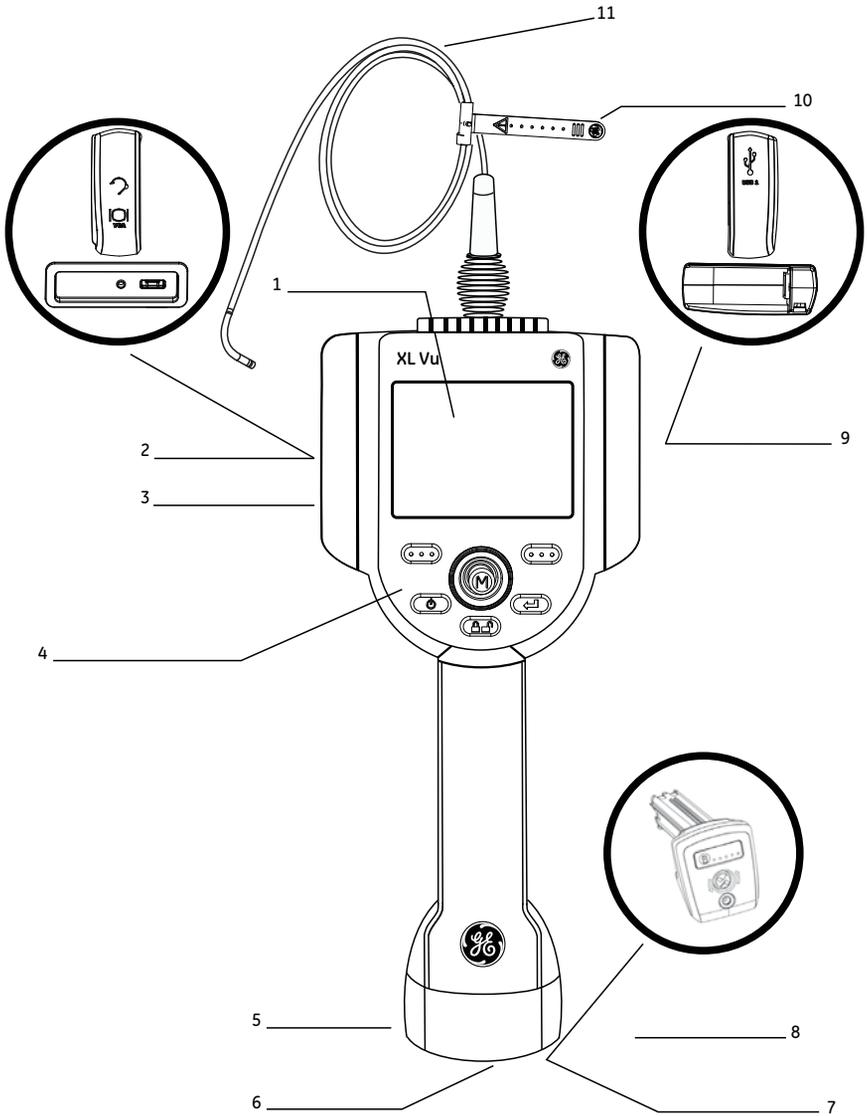


Indicators, and Connectors

- 1 LCD Screen
- 2 Integrated 2.5 mm headset/microphone jack
- 3 VGA output
- 4 Controls
- 5 AC to DC Power Supply
- 6 USB Bay
- 7 Insertion Tube Strap
- 8 Insertion Tube

Introduction

Battery XL Vu



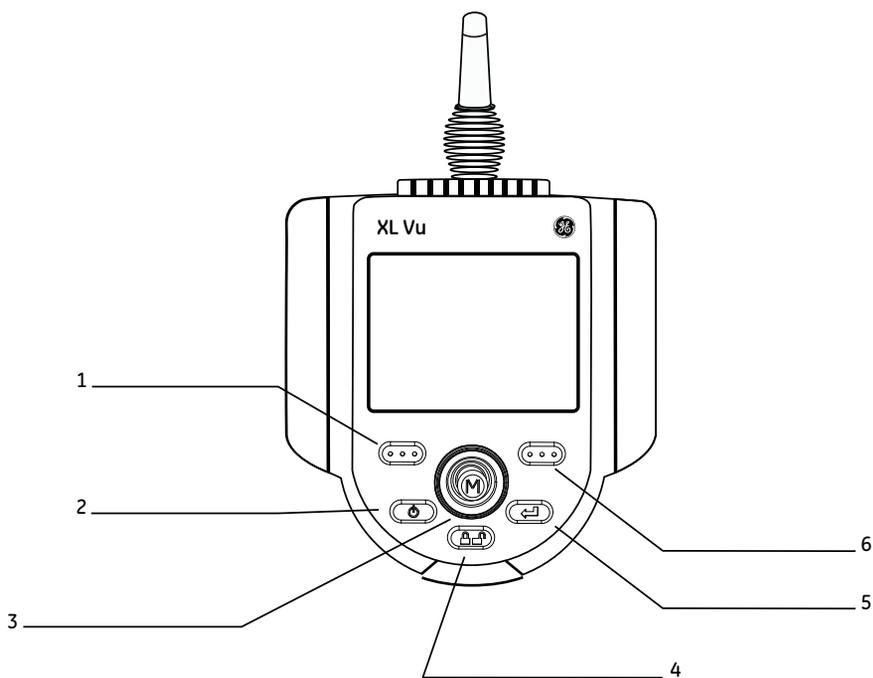
Indicators, and Connectors

- 1 LCD Screen
- 2 Integrated 2.5 mm headset/microphone jack
- 3 VGA output
- 4 Controls
- 5 2-hour Lithium Ion Battery
- 6 Battery Locking Screw
- 7 Battery Charge Indicator
- 8 AC to DC Adaptor Input
- 9 USB Bay
- 10 Insertion Tube Strap
- 11 Insertion Tube

Introduction

Controls

The following buttons control basic and advanced operation of the XL Vu VideoProbe.



Introduction

1 Left Soft Key

Activates screen command listed on system LCD. This key will most frequently return the user BACK one screen.

2 Power/Exit

Turns system power on/off. Also used to exit menus, return to live/frozen video and disable image control features.

3 Joystick

Controls articulation. Press to activate the Live Main Menu, Recalled Image Menu, and Freeze Frame Menu. Push the joystick left/right/up/down to navigate menus and sub-menus.

4 Steering Control

Press and release to keep bending neck locked in place after the joystick is released. A  lock will appear on the LCD when enabled. Press and release again to unlock the steering control. The  lock will disappear from LCD when disabled. Also, press and hold to engage HOME function to straighten bending neck. A blinking  Home icon will appear on the LCD when enabled. This icon will disappear when finished.

5 Freeze/Enter

Freezes the image on-screen. Also acts as enter key for selecting options.

6 Right Soft Key

Activates screen command listed on system LCD. This key will most frequently serve to SELECT active menu choices.

Safety Information

Note: Before using or servicing the system, read and understand the following safety information.

Symbols and Terms

The following symbols appear **on the product**:



See accompanying documentation.

General Warnings

The following warning statements apply to use of the system in general. Warning statements that apply specifically to particular 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.



XL Vu power supply is rated for indoor use only.



General Cautions

The following caution statements apply to use of the XL Vu 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.

Safety Information

Battery Warnings (Battery XL Vu Only)

Only use the battery (XLGOABATTA or XLGOABATTB) and power supply (XLGOACHGR) specified for use with the XL Vu system.

Before use, thoroughly review the instructions in this manual for the battery and battery charger to fully understand the information contained in them, and observe the instructions during use.



WARNING

- Do not place the battery in fire or exceed the battery operating temperature.
- Do not pierce the battery with nails, strike the battery with a hammer, step on the battery, or otherwise subject it to strong impacts or shocks.
- Do not expose the battery to water or salt water, or allow the battery to get wet.
- Do not disassemble or modify the battery.



Battery Communication Error. Contact Customer Service at +1 315 554 2000.

Using the battery outside its recommended operating range will result in degradation of the performance and service life. When storing the battery, be sure to remove it from the base unit.

Recommended temperature range for Li-ion battery operation.

Discharge (when using the instrument): : -20° C to 46° C

Recharging : 0° C to 40° C

Storage : -25° C to +60° C

Safety Information

Remarque : avant l'utilisation ou l'entretien du système, vous devez lire et comprendre les informations de sécurité qui suivent.

Symboles et termes employés

Les symboles suivants sont apposés **sur le produit** :



Voir la documentation jointe.

Avertissements généraux

Les avertissements suivants s'appliquent à l'utilisation du système en général. Les avertissements qui s'appliquent spécifiquement à des procédures particulières sont indiqués dans les sections correspondantes de ce manuel.



Le système XL Vu et les outils de travail qui l'accompagnent ne doivent jamais entrer en contact direct avec une source de tension ou de courant. Évitez tout contact avec des conducteurs ou des bornes électriques sous tension. L'équipement risquerait d'être endommagé, ou l'opérateur de subir un choc électrique.



N'utilisez pas ce système dans un environnement à risque d'explosion.



UTILISER CORRECTEMENT. Si un élément de cet équipement est utilisé d'une manière non indiquée par le fabricant, l'utilisateur peut ne plus être protégé des risques de blessure.



Mentions générales « Attention »

Les mentions « Attention » qui suivent s'appliquent à l'utilisation de l'appareil XL Vu en général. Les mentions « Attention » qui s'appliquent spécifiquement à des procédures particulières sont indiquées dans les sections correspondantes du manuel.

MANIPULER LA SONDE AVEC PRÉCAUTION. Maintenez la gaine de la sonde à l'écart d'objets pointus ou tranchants qui risqueraient

Safety Information

de traverser son fourreau. Maintenez toute la gaine aussi droite que possible pendant l'utilisation : en cas de boucle ou de courbure, il est plus difficile de piloter le bout de la sonde. Évitez de trop courber la gaine.

Remarque : utilisez toujours le bouton de rangement pour redresser le béquillage avant de rétracter la gaine de la zone d'inspection ou de ranger la sonde. Ne manipulez jamais le béquillage à la main pour le tirer, le courber ou le redresser : vous risqueriez de l'endommager à l'intérieur. Envoyez la sonde en réparation au premier signe d'endommagement.

Certaines substances risquent d'endommager la sonde. Pour consulter la liste des substances sans danger pour la sonde, voir Compatibilité Chimique en annexe.

Avertissements liés à la batterie

Utilisez uniquement la batterie (XLGOABATTA or XLGOABATTB) et l'alimentation (XLGOACHGR) spécifiées pour être utilisées avec le système XL Vu.

Avant utilisation, lisez attentivement les instructions contenues dans ce manuel relatives à la batterie et au chargeur de batterie pour bien les comprendre, et respectez ces instructions pendant l'utilisation de l'appareil.



AVERTISSEMENT

- Ne jetez pas la batterie au feu et ne dépassez pas sa température de fonctionnement.
- Ne percez pas la batterie avec des clous, ne la frappez pas avec un marteau, ne marchez pas dessus et ne la soumettez pas à des impacts ou des chocs violents.
- N'exposez pas la batterie à l'eau douce ou salée, et évitez de la mouiller.
- Ne désassemblez pas la batterie et ne la modifiez pas.



Erreur de communication de la batterie. Veuillez contacter le Service clientèle au numéro +1 315 554 2000.

L'utilisation de la batterie en dehors de la plage de fonctionnement recommandée entraînerait une dégradation de ses performances et de

Safety Information

sa longévité. Lorsque vous stockez la batterie, veillez à la retirer de sa base.

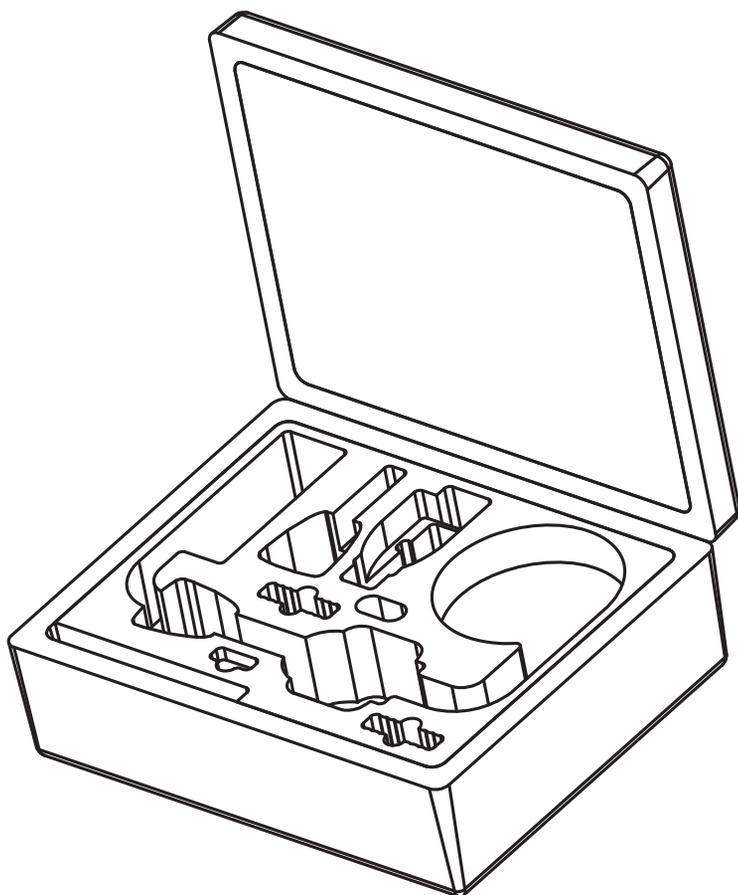
Plage de température recommandée pour le fonctionnement de la batterie Lithium-Ion.

Décharge (à l'utilisation de l'appareil) : -20°C à +46°C Recharge , 0°C à +40°C Stockage, -25°C à +60°C

Getting Started

System Removal

Gently remove the insertion tube and handset from the storage case.



Getting Started

System Power On

Press and hold the  Power/Exit key briefly to power on. The buttons and Liquid Crystal Display (LCD) will light and begin the power-up sequence. After approximately 30 seconds, the system screen will display live video and screen prompts. The system is now ready for use.



Note: All batteries are shipped with a partial charge. Batteries should be fully charged prior to use.

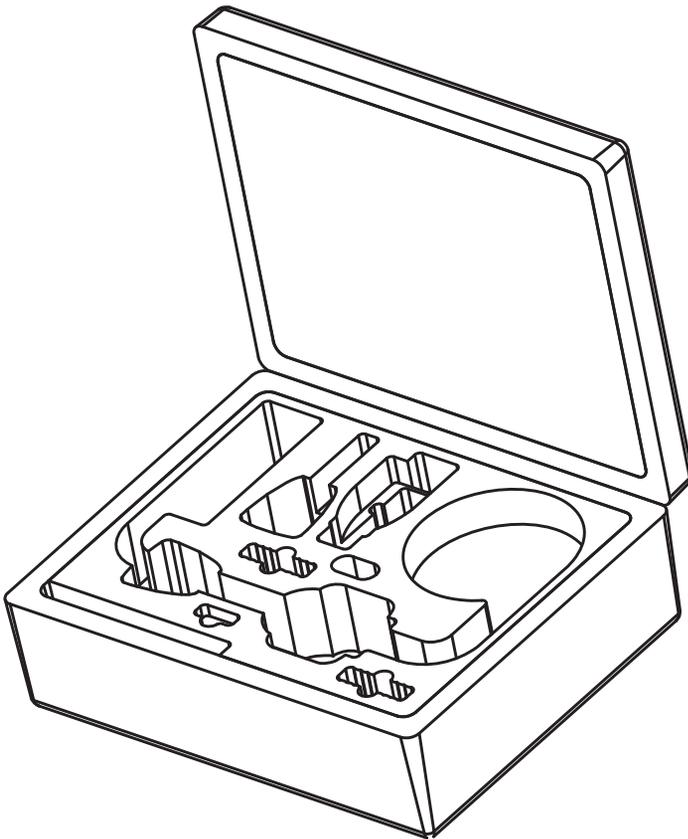
Getting Started

System Power Off

Press and hold the  Power/Exit key until the “SYSTEM SHUTTING DOWN” message appears. Key illumination and LED probe lights will go out when system is completely powered down.

System Storage

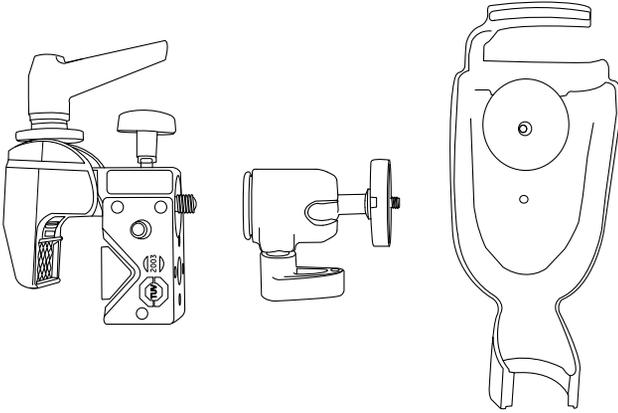
Carefully coil the insertion tube into the storage area. Place the XL Vu handset into the designated foam cutout. LCD screen should face up.



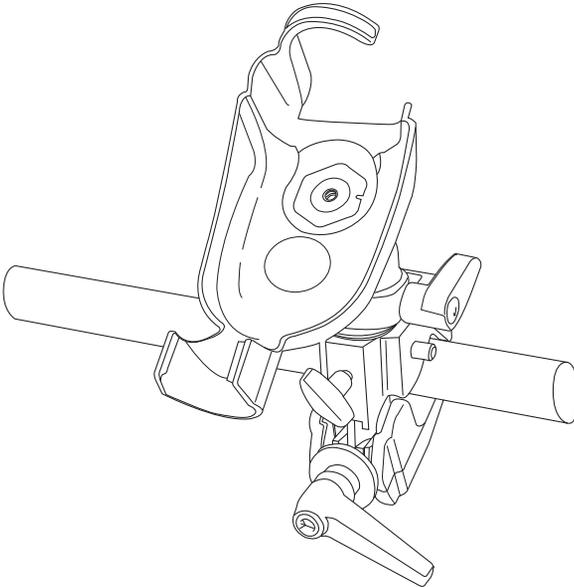
Getting Started

Mounting Accessories

Assemble the optional mounting accessories by screwing together the mini magic clamp, swivel ball, and handset holder.



Secure the XL Vu mini magic clamp and place the XL Vu system in the handset holder.



Getting Started

Battery

Installing Battery

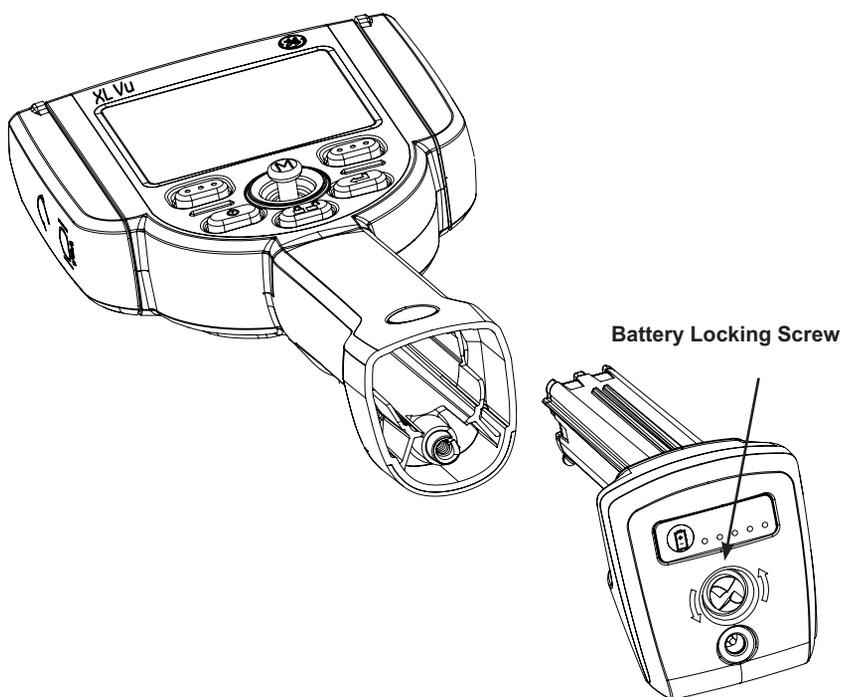
Insert the battery into the handset. The battery is installed properly when the latching mechanism is engaged.

Note: Do not force the battery into the handset, as damage may occur. The battery is keyed and may only be installed in the proper orientation.

Removing Battery

Using a slotted screw driver or coin, turn the locking screw counterclockwise and release the battery.

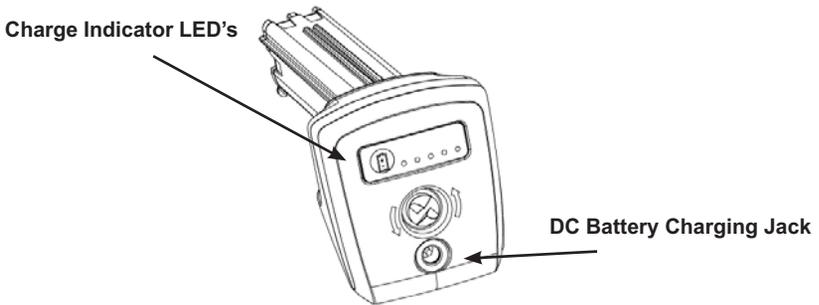
Note: Do not remove battery while system is operating.



Getting Started

Battery Charge Level

Check the battery charge by pressing the battery symbol on the front of the battery. Each light represents approximately 20% of the battery charge capacity.



Charging Battery

Plug the included XLGOACHGR power adaptor into a suitable AC power source and connect the DC output of the battery charger into the XL Vu battery. The LED battery lights will illuminate according to the amount of charge attained. The system may operate while charging.

The battery may also be charged while disconnected from the system. When the battery is fully charged, the LED battery lights will turn off.

Note: Battery run time typically equals battery charge time; therefore, a four hour battery will take approximately four hours to charge.

Getting Started

Saving Images and Video

Still Images

To capture a still image, compose the picture and press and release  Freeze/Enter. Press the  right soft key with SAVE on the LCD above to save to the default location.

Alternately, from live video, press and hold  Freeze/Enter to quick-save.

Video

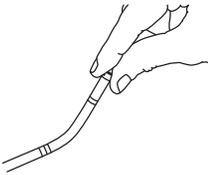
To record live video, press and hold the  left soft key labeled RECORD on the LCD above. A red record symbol will appear in the upper right hand corner. When the video is stopped, it will automatically save to the default location.

Optical Tips

Optical tips are attached to the insertion tube using a double thread. This prevents unintended departures of optical tips from the probe. Each optical tip provides a unique depth of field (DOF), field of view (FOV) and direction of view (DOV). A complete list of available tips is provided in the Appendix.

Optical Tip Removal

1. Grasp the head of the probe with one hand and gently loosen the tip counterclockwise with the other hand. The tip has cleared the first set of threads when it spins freely.
2. Gently pull the tip away from the probe and continue loosening counterclockwise until the tip is free from the second set of threads.



Optical Tip Installation

1. Ensure the optical tip is clean. Clean if necessary (See Cleaning Optical Tips).
2. Grasp the head of the probe with one hand and gently turn the tip clockwise with the other hand. The tip has cleared the first set of threads when it spins freely and then seats with gentle force applied.
3. Gently push the tip onto the probe and continue turning clockwise on the second set of threads until the tip is attached finger tight. Do not over tighten. Pull gently on the tip to ensure proper attachment to the probe.

NOTE: Never use tools or excessive force to install or remove an optical tip.

Getting Started

Tip Tool Proper Use (3.9 mm only)

Removing Tips

1. Apply empty tip tool to probe head.
2. Apply pressure while turning in the counter-clockwise position.
3. When tip tool spins freely, gently pull up while twisting in the counter-clockwise position to release the second set of threads.
4. Remove tip tool and tip will be within.

Applying Tips

1. Apply tip tool containing appropriate tip to probe head.
2. Apply pressure while turning in the clockwise position.
3. When tip tool spins freely, gently push down while twisting in the clockwise position to engage the second set of threads.
4. Pull gently on tip tool to ensure proper attachment.
5. Remove tip tool and tip will be attached to probe head.

NOTE: Never use excessive force to install or remove an optical tip.

Common Tasks

GO TO Menu

Many common operating tasks are available in the GOTO menu. This menu is available by pressing the  right soft key labeled GOTO during live video mode. To exit any menu, press  Power/Exit.

GO TO > File Manager

To enter the file manager, navigate to FILE MANAGER with the joystick and select with the  right soft key labeled SELECT.



Common Tasks

GO TO > Eject Hardware

To eject USB thumb drives before removal, use the joystick to navigate to the right of EJECT HARDWARE and select USB1 using the right soft key labeled SELECT.

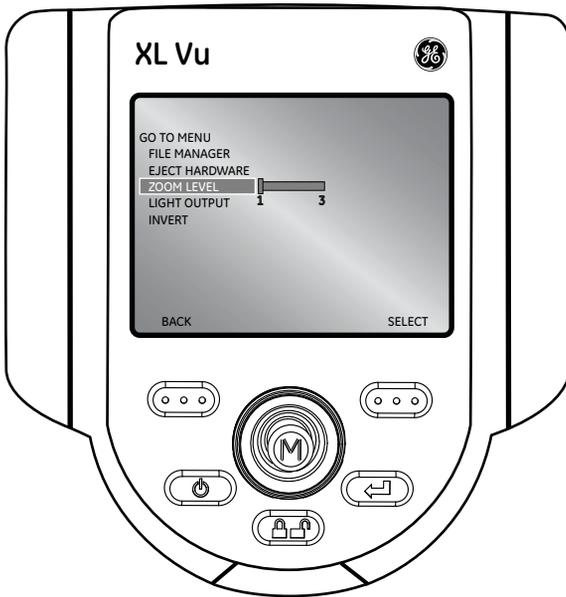
Note: Always use EJECT HARDWARE before removing a USB thumb drive to prevent loss of data.



Common Tasks

GO TO > Zoom Level

An image can be zoomed from 1 (normal view) to 3 (3 times zoomed). Navigate to the right of ZOOM LEVEL and use the joystick to adjust the zoom level.



Common Tasks

GO TO > Light Output

To turn the LED optical light On or Off, navigate to the right of LIGHT OUTPUT and select ON or OFF.



Note: Turning on FREEZE FRAME is a convenient way to turn off the light output and is ideal for changing optical tips and conserving battery charge.

Common Tasks

GO TO > Invert

The invert function flips an image horizontally. To activate or deactivate, navigate to INVERT and choose ON or OFF. Invert may be turned off in live video mode by pressing the  Power/Exit key.



Common Tasks

Live Main Menu

To activate the LIVE MAIN MENU, press and release the joystick. To exit any menu, press  Power/Exit.

Live Main Menu > Light Output

To turn the LED optical light on/off, use the joystick to choose LIGHT OUTPUT and select ON or OFF.



Note: Turning on FREEZE FRAME is a convenient way to turn off the light output and is ideal for changing optical tips. For Battery models this also conserves battery charge.

Common Tasks

Live Main Menu > Image Control

From the LIVE MAIN MENU, select IMAGE CONTROL. The changes made to the Image Controls take effect immediately.



The following options are then available:

- Image Brightness
- Zoom Level
- Invert

Note: By pressing the  power/exit key twice, any image control features will be turned off and returned to factory default settings.

Common Tasks

Live Main Menu > Image Control > Image Brightness

Navigate to IMAGE BRIGHTNESS from the IMAGE CONTROL Menu and use the joystick to adjust the image brightness.



Common Tasks

Live Main Menu > Image Control > Zoom Level

Navigate to ZOOM LEVEL from the IMAGE CONTROL Menu and use the joystick to adjust the zoom level. Digital zoom levels from 1x to 3x may be selected.



Common Tasks

Live Main Menu > Image Control > Invert

The invert function flips an image horizontally. To activate or deactivate Invert, navigate to INVERT from the IMAGE CONTROL MENU and select ON or OFF.



Note: This feature is most useful when using Sideview Optical Tips.

Live Main Menu > Annotation

Annotating an XL Vu image means adding text or arrows to describe or point out areas of interest: cracks, defects, etc. Annotation may be used on live, frozen, and recalled images.

To alter the annotation settings, press the joystick to activate the LIVE MAIN MENU and select ANNOTATION.



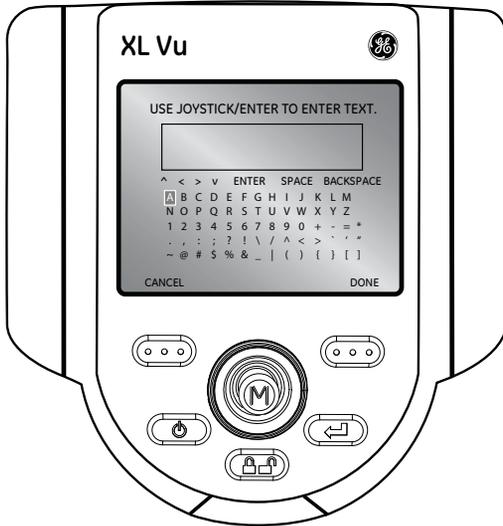
Note: There is a maximum of 3 lines of text/arrows per annotation.

Note: See the Freeze Frame Menu to enable Audio Annotation.

Common Tasks

Live Main Menu > Annotation > Text

To add, edit, or clear text on a specific image, select TEXT from the ANNOTATION menu.



Note: Maximum number of text annotations is 50.

Common Tasks

Live Main Menu > Annotation > Arrow

To add, edit or clear arrow on a specific image, select ARROW from the ANNOTATION menu.



Note: Maximum number of arrow annotations is 25.

Common Tasks

Live Main Menu > Annotation > Preset

To create, recall or delete a preset annotation that will display throughout an inspection, choose PRESET from the ANNOTATION menu.



Note: Maximum number of preset annotations is 100.

Common Tasks

Live Main Menu > Annotation > Hide Annotation

To hide or unhide an annotation, select HIDE ANNOTATION from the ANNOTATION menu followed by ON or OFF.



Common Tasks

Live Main Menu > File Manager

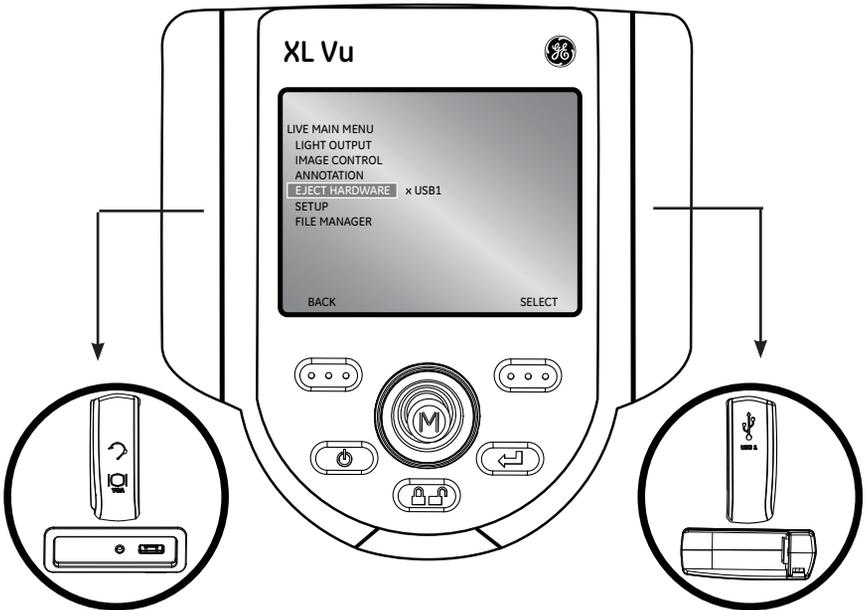
To manage files and folders on the XL Vu VideoProbe system, select FILE MANAGER with the joystick. For more details refer to the FILE MANAGEMENT section in the Operation Chapter.



Common Tasks

Live Main Menu > Eject Hardware

To eject USB thumb drives before removal, use the joystick to navigate to the right of EJECT HARDWARE and select USB1 using the right soft key labeled SELECT.



Note: Always use EJECT HARDWARE before removing a USB thumbdrive to prevent loss of data.

Common Tasks

Live Main Menu > Setup

To change default settings, select SETUP. For more information see SYSTEM SETUP Section in the Operation Chapter.



Live Main Menu > Setup

The System Setup Menu accesses the default settings. To exit any menu, press  Power/Exit.

Live Main Menu > Setup > Screen/Display Setup

To alter the display setup, press the joystick to activate the LIVE MAIN MENU. Select SETUP followed by SCREEN/DISPLAY.



Operation

Live Main Menu > Setup > Screen/Display Setup > Battery Icon (Battery Version Only)

To enable and disable the battery icon, select BATTERY ICON followed by ON or OFF.



Live Main Menu > Setup > Screen/Display Setup > Date / Time

To enable or disable the date/time stamp, as well as set the date and time, select DATE/TIME from the SCREEN/DISPLAY menu.



Operation

Live Main Menu > Setup > Screen/Display Setup > Logo

A logo may be added to the screen. The file name “logo.jpg” must be used. To load a logo, or to turn a logo on or off, select LOGO from the SCREEN/DISPLAY menu and select the desired option.



Note: See Appendix F for details on creating a logo file.

Live Main Menu > Setup > Screen/Display Setup > Text Color

The most legible text color will vary with the coloring and brightness of the image. To change the color of the text displayed over images, select TEXT COLOR followed by GREEN, BLACK, or WHITE.



Operation

Live Main Menu > Setup > Screen/Display Setup > White Balance

White balance corrects color so white appears white despite any slight hues that may be present under varying lighting and ambient conditions.

To execute white balance, select WHITE BALANCE from the SCREEN/DISPLAY menu. Options are to set a custom white balance or use the default settings.



Live Main Menu > Setup > Video Record Setup

To change video record defaults, press the joystick to activate the LIVE MAIN MENU. Select SETUP followed by VIDEO RECORD SETUP.



Operation

Live Main Menu > Setup > Video Record Setup > Save Location

Select SAVE LOCATION from the VIDEO RECORD SETUP menu and navigate to the desired location.



Live Main Menu > Setup > Video Record Setup > MPEG Quality

To set the video quality, select MPEG QUALITY from the VIDEO RECORD SETUP menu followed by LOW or HIGH.



Operation

Live Main Menu > Setup > Still Image Setup

To change still image defaults, press the joystick to activate the LIVE MAIN MENU. Select SETUP followed by STILL IMAGE SETUP.



Live Main Menu > Setup > Still Image Setup > Save Location

Select SAVE LOCATION from the STILL IMAGE SETUP menu and use the joystick to navigate to the desired location.



Operation

Live Main Menu > Setup > Still Image Setup > Format

To choose the image format [Bitmap (BMP) or JPEG (JPG)], navigate to the right of FORMAT and select BMP or JPG.



Live Main Menu > Setup > Still Image Setup > JPEG Quality

To choose JPEG quality, the user must first select JPEG image format. Once selected, navigate to the right of JPEG QUALITY and select LOW or HIGH.



Operation

Live Main Menu > Setup > Audio Annotation Setup

To change audio defaults, press the joystick to activate the LIVE MAIN MENU. Select Setup followed by AUDIO ANNOTATION SETUP.



Note: To access AUDIO ANNOTATION, press the Joystick from a frozen image. Select ANNOTATION followed by AUDIO. The following options will be available:

- RECORD
- PLAY
- DELETE

Live Main Menu > Setup > Audio Annotation Setup > Playback Volume

To set the playback volume, select PLAYBACK VOLUME from the AUDIO ANNOTATION SETUP menu. Use the joystick to control the volume from 0 to 10.



Operation

Live Main Menu > Setup > Language Setup

To load or change the system language, select LANGUAGE SETUP from the SETUP menu followed by the appropriate language.



The following options are available:

- LOAD
- CHANGE

Live Main Menu > Setup > System Tools

To view system information or adjust power management, select SETUP from the LIVE MAIN MENU followed by SYSTEM TOOLS.



Operation

Live Main Menu > Setup > System Tools > System Info

To view system information such as the software version or the amount of free disk space, select SYSTEM INFORMATION from the SYSTEM TOOLS menu.



Capturing Images and Video

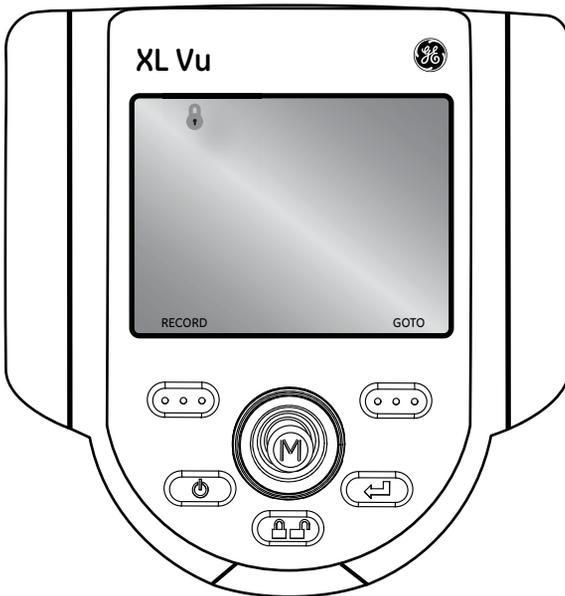
Steering the VideoProbe

The joystick controls articulation (steering) of the probe tip. When viewing a live video image, move the joystick towards the desired inspection area.

Articulation Lock

To hold the bending neck in place while steering, press and release the  Steering Control key. A  lock icon will appear in the corner of the display to symbolize steer and stay is enabled. The probe will now stay in place when the joystick is released.

To unlock steering, press and release  Steering Control again. The  lock icon will disappear.

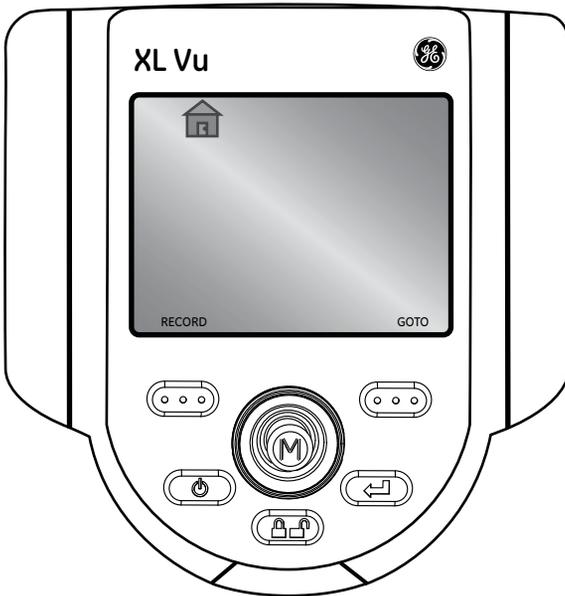


Operation

Articulation Home

Press and hold  to engage HOME function to straighten bending neck. A blinking  home icon will appear on LCD when enabled.

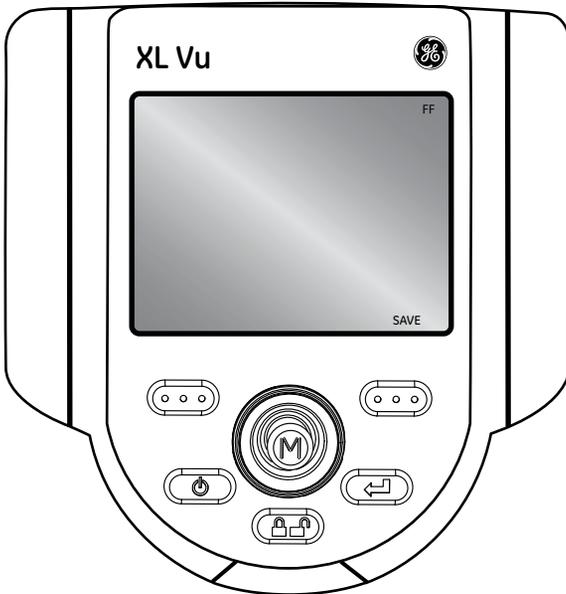
 HOME icon will disappear when system is finished.



Freeze Frame

Once the inspection area is in view, the image must be frozen before it can be measured or saved. To freeze an image, press  Freeze/Enter. An “FF” will appear in the upper right corner of the display to symbolize that the image is frozen.

To disable Freeze Frame, press  Freeze/Enter again. The “FF” will disappear.



Operation

Freeze Frame Menu

Once Freeze Frame is enabled, press the joystick to enter the FREEZE FRAME MENU.



The following options are available:

- SAVE AS
- ANNOTATION

File Manager

To access the FILE MANAGER, press the joystick to activate the LIVE MAIN MENU. Navigate to FILE MANAGER and select.

File Manager > Recall

To recall a file, select RECALL. Move the joystick to the right to locate the file(s) and use the  right soft key to select.



Operation

Recalled Image Menu

After recalling an image, press the joystick to activate the RECALLED IMAGE MENU.



The following options are available:

- SAVE AS
- ANNOTATION

File Manager > Copy

To copy a file, select COPY. Move the joystick to the right to locate the file(s) and use the  right soft key to mark/unmark. Press  Freeze/Enter to copy.

Choose the destination for the copied file. Use the joystick to navigate to the desired folder. Press  Freeze/Enter to paste the copied file.



Operation

File Manager > Delete

To delete a file, select DELETE FILE. Move the joystick to the right to locate the file(s) and select. Press  Freeze/Enter to delete.



File Manager > Create Folder

To create a folder, select CREATE FOLDER. Select the location of the folder. Use the joystick to highlight and  Freeze/Enter to select each letter. When done, press the  right soft key to save the folder name.



Operation

File Manager > Rename

To rename a file, select RENAME. Navigate to the desired file/folder and use the  right soft key to select. Use the joystick to highlight and  Freeze/Enter to select each letter. When finished, press the  right soft key to save the file name.



File Manager > Still Image Setup

To save/capture a still image if freeze frame is enabled, press the  right soft key with SAVE on the LCD above to save to the default location. Alternately, press and hold  Freeze/Enter to auto-save.

File Manager > Video Record Setup

To record live video, press the  left soft key labeled RECORD on the LCD above. A record symbol will appear in the upper right hand corner. When the video is stopped, it will automatically save to the default location.



QuickTime

To view recorded videos, use either QuickTime or VLC software. Both are included with the system, located on the documentation CD.

Operation

Video Playback Menu

After recalling a video, press the left  soft key to pause the video. Press the joystick to enable the PLAYBACK MENU.



The following options are available:

- SEEK
- STOP

Note:

- Use the joystick to navigate through the video.
- Press the right  soft key to select the new playback start location.
- Press the left  soft key to return back to the video playback starting scene.
- Press the left  soft key to resume the video playback.

Inspecting and Cleaning the System

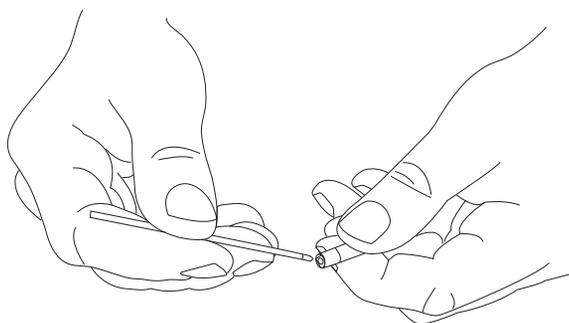
Inspect and clean the XL Vu system before and after each use with a soft cloth and a 70% alcohol-to-water solution. If using the system in a dirty environment, clean the components more frequently, as needed.

If damage is found, contact GE Sensing and Inspection Technologies for return instructions and an RMA (return material authorization) number. Early detection of minor conditions can prevent costly repair.

Cleaning Optical Tips

Dirty optical tip surfaces cause distorted or blurred images. For best image quality, clean the optical tip and camera head frequently.

To clean the probe tip, including the lens on the camera head, use glass cleaner or 70% alcohol-to-water solution and a pointed cotton swab. Three surfaces need cleaning: the head can optics, the outside of the tip, and the inside of the tip.



Maintenance

Sales and Technical Support

USA	1 888 332 3848 (toll free in USA only) 1 315 554 2000 (Phone) 1 866 899 4184 (Fax)
Canada	877 895 5665 780 430 9060
France	+33 2 28 23 08 00
Germany	+49 7471 98820
Hong Kong	+852 2877 0801
Italy	+39 39 65 1341
Japan	+81 422 67 7067
United Kingdom	+44 1993 822613

Web Site

www.geinspectiontechnologies.com

Service

To obtain service for a VideoProbe system, please contact one of the service centers below. 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.

Always contact an authorized GE Inspection Technologies service center for an RMA prior to returning a product for service and/or repair.

USA

GE Inspection Technologies
721 Visions Drive
Skaneateles, NY 13152
Phone: 1 888 335 3848 (toll-free in USA only)
1 315 554 2000
Fax: 1 866 899 4184

Germany

GE Inspection Technologies GmbH
Lotzenacker 4
72379 Hechingen
Phone: +49 7471 98820
Fax: +49 7471 7882 30

Hong Kong

GE Inspection Technologies (HK) Ltd.
Unit 1602, 16/F Sing Pao Building
101 Kings Road
North Point
Hong Kong
Phone: +852 2877 0801
Fax: +852 2877 0868

Technical Specifications

Technical Specifications:

Operating Temperature	
Tip	-25°C to 80°C (-13°F to to 176°F) Reduced articulation below 0°C (32°F)
System	-20° to 46° C (-4°F to 115°F) LCD requires warm-up period below 0°C (32°F)
Storage Temperature	-25° to 60° C (-13°F to 140°F)
Relative Humidity	95% max, non-condensing
Waterproof	Insertion tube and tip to 14.7 psi (1 bar, 10.2m of H ₂ O, 33.5 ft of H ₂ O)
Hazardous Environments	Not rated for use in hazardous environments.
Camera	
Diameter Probe	6.1 mm (0.24")
Image Sensor	1/6" Color SUPER HAD™ CCD camera
Pixel Count	440,000 pixels
Housing	Titanium
Diameter Probe	3.9 mm (0.15")
Image Sensor	1/10" Color SUPER HAD™ CCD camera
Pixel Count	290,000 pixels
Housing	Titanium
System	
System Dimensions	9.5 x 13.3 x 34.3 cm (3.8 x 5.3 x 13.5")
Case Dimensions	62.5 x 21.8 x 50.0 cm (24.6 x 8.6 x 19.7")
System Weight	Battery XL Vu: In Case - 8.23 kg (18.15 lbs) Out of Case - 1.77 kg (3.90 lbs)
	Corded XL Vu: In Case - 8.63 kg (19.02 lbs) Out of Case - 2.16 kg (4.77 lbs)

Technical Specifications

Construction	Polycarbonate housing with integrated Versalon™ bumpers
LCD Monitor	Integrated 9.4 cm (3.7") active matrix VGA color LCD
Joystick Control	360° All-Way® tip articulation, menu access, and navigation
Button Set	Access user functions, measurement, and digital functions
Audio	Integrated 2.5mm headset / microphone jack
Internal Memory	1GB flash memory
Data I/O ports	1 USB 2.0 port VGA Video Out
Brightness Control	Auto and Variable
Illumination Type	White LED
White Balance	Factory default or user defined
Power	
Lithium Ion Battery	8.4 V 38 Wh (2-hour) or 75 Wh (4-hour)
Power Supply	
Corded XL Vu	<u>AC Input:</u> 90-264 Vac 47-63 Hz <.75 A rms @ 115 Vac <u>DC Output:</u> 9V +/-5%, 3.4A
Battery XL Vu	<u>AC Input:</u> 90-264 Vac, 47-63Hz, <1.2Arms @ 90 Vac <u>DC Output:</u> 10.2V +5/-3%. 4.9A
Standards Compliance and Classifications	
Standards Compliance	Group 1, Class A: EN61326-1(Basic radiated immunity), UL, IEC, EN CSA-C22.2:61010-1, UN/DOT T1-T8

Technical Specifications

Software	
Operating System	Real-time, multi-tasking operating system
User Interface	Simple drop-down, menu-driven operation, menu navigation using articulation joystick
File Manager	Embedded file manager software supporting: file and folder creation, naming, deleting, storing to internal flash or USB ThumbDrive®, copying between USB and internal flash
Audio Data	PC compatible (.aac) file format
Image Control	Zoom (5x digital), Image Capture and Recall
Digital Zoom	Continuous (5x)
Image Formats	Bitmap (.BMP), JPEG (.JPG)
Video Format	MPEG4 (.MP4)
Text Annotation	Built-in full-screen text overlay generator
Graphic Annotation	User placement of arrows
Articulation Control	Steer & Stay Articulation lock/fine articulation, tip “Home” return to neutral forward-tip orientation User-selectable fine or coarse control
Software Updates	Field upgradable via USB ThumbDrive®
Languages	English, Spanish, French, German, Italian, Russian, Japanese, Korean, Portuguese, Chinese, and Polish

Technical Specifications

Probe Measurements	
Diameter	Length
3.9 mm (0.15")	2.0, 3.0 m (6.6, 9.8 ft.)
6.1 mm (0.24")	2.0, 3.0, 4.5, 8.0 m (6.6, 9.8, 14.8, 26.2 ft.)

Tip Articulation	
Insertion Tube Length	One Loop
2.0, 3.0, 4.5 m	Up/Down 100° min Left/Right 100° min
8.0 m	Up/Down 90° min Left/Right 90° min

Note: Typical articulation exceeds minimum specifications.

Appendix

A. Optical Tip Table

Tip	Diameter (mm)	View (DOV)	Color	Field of View (FOV)	Depth of Field (DOF)	Part Number
Standard Optical Tips						
	3.9	Forward	None	80	6-80mm .24-3.15"	PXT480FG
	3.9	Side	Brown	80	4-80mm .16-3.15"	PXT480SG
	3.9	Forward	Yellow	90	3-40mm .12-1.57"	PXT490FN
	3.9	Side	Red	90	2-16mm .08-.63"	PXT490SN
	6.1	Forward	None	50	50mm-infinity 1.97" - infinity	XLG3T6150FF
	6.1	Forward	White	50	12-200mm .47-7.87"	XLG3T6150FG
	6.1	Forward	Black	120	5-120mm .20-4.72"	XLG3T61120FG
	6.1	Forward	Orange	80	3-20mm .12-.79"	XLG3T6180FN
	6.1	Forward	Yellow	90	20mm-infinity .79"-infinity	XLG3T6190FF
	6.1	Forward Oblique	Purple	50	12-80mm .5-3.2"	XLG3T6150FB
	6.1	Side	Brown	50	45mm-infinity 1.77"-infinity	XLG3T6150SF
	6.1	Side	Green	50	9-160mm .35-6.30"	XLG3T6150SG
	6.1	Side	Blue	120	4-100mm .16-3.94"	XLG3T61120SG

Appendix



6.1 Side Red 80 1-20mm
.04-.79" XLG3T6180SN



6.1 Side Green 50 9-160mm
.35-6.30" XLG3T6150SG



6.1 Side Brown 50 45mm
1.77"-infinity XLG3T6150SF

Appendix

B. Chemical Compatibility

Chemical compatibility refers to the probe's ability to come into contact with various liquid substances 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-4 Fuel
- Kerosene
- Synthetic Turbo Oil
- Gasoline
- Diesel Fuel
- Hydraulic Oil
- Inhibited Transformer Oil

Subsequent to contact with the above fluids, the insertion tube must be cleaned prior to storage.

C. Warranty

GE Inspection Technologies warrants its VideoProbe components, when new, to be free from defects in material and workmanship and to perform in accordance with manufacturer's specifications under normal use and service for a period of one year from the date of purchase from GE Inspection Technologies or its authorized distributors, except that, the light source is warranted for a period of 3 years from the date of purchase, the battery is warranted for a period of 30 days from the date of purchase, and where used, servo motors in the articulation drive system are warranted for the life of this VideoProbe product.

GE Inspection Technologies' obligation under this warranty is limited to the repair or replacement of components determined by GE Inspection Technologies to be defective within the warranty period at no cost to the original purchaser, except for return shipping expenses. It shall be the purchaser's responsibility to return the product to GE Inspection Technologies or one of its authorized service centers. The warranty does

Appendix

not cover accessories or optional equipment not manufactured by GE Inspection Technologies, but these items may be covered by separate manufacturers' warranties.

This warranty extends to the original purchaser and cannot be assigned or transferred to any third party. This warranty shall not apply to any damage or product failure determined by GE Inspection Technologies to have been caused by misuse, accident (including shipping damage), neglect, improper maintenance, modification or repair by someone other than GE Inspection Technologies or one of its authorized service representatives.

These express warranties are in lieu of any other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose, and no other person has been authorized to assume for GE Inspection Technologies any other liability in connection with the sale of its VideoProbe products. GE Inspection Technologies shall not be liable for any loss or damages, whether direct or indirect, incidental, or consequential, resulting from the breach of any express warranty set forth herein.

D. Environmental Compliance



The equipment purchased has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

In order to avoid the dissemination of those substances in the environment and to diminish the pressure on the natural resources, we encourage the use of appropriate take-back systems. Those systems will reuse or recycle most of the materials of end-life equipment in a sound way.

The cross-out wheeled bin symbol encourages the use of those systems.

If more information is needed on the collection, reuse, and recycling systems, please contact the appropriate local or regional waste administration.

Appendix



This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling return the battery to your supplier or to a designated collection point.

What do the markings mean?

Batteries and accumulators must be marked (either on the battery or accumulator or on its packaging, depending on size) with the separate collection symbol. In addition, the marking must include the chemical symbols of specific levels of toxic metals as follows:

Cadmium (Cd) over 0.002%

Lead (Pb) over 0.004%

Mercury (Hg) over 0.0005%

The risks and your role in reducing them

Your participation is an important part of the effort to minimize the impact of batteries and accumulators on the environment and on human health. For proper recycling you can return this product or the batteries or accumulators it contains to your supplier or to a designated collection point. Some batteries or accumulators contain toxic metals that pose serious risks to human health and to the environment. When required, the product marking includes chemical symbols that indicate the presence toxic metals: Pb for lead, Hg for mercury, and Cd for cadmium. Cadmium poisoning can result in cancer of the lungs and prostate gland. Chronic effects include kidney damage, pulmonary emphysema, and bone diseases such as osteomalacia and osteoporosis. Cadmium may also cause anemia, discoloration of the teeth, and loss of smell (anosmia). Lead is poisonous in all forms. It accumulates in the body, so each exposure is significant. Ingestion and inhalation of lead can cause severe damage to human health. Risks include brain damage, convulsions, malnutrition, and sterility. Mercury creates hazardous vapors at room temperature. Exposure to high concentrations of mercury vapor can cause a variety of severe symptoms. Risks include chronic inflammation of mouth and gums, personality change, nervousness, fever, and rashes.

Visit www.geinspectiontechnologies.com for take-back instructions and more information about this initiative.

E. Agency Certifications

European Equipment Classification

Group 1, Class A

The  mark on this product indicates it has been tested to and conforms

Appendix

with the provisions noted within the 2004/108/EC Electromagnetic Compatibility Directive. The XL Vu system is in conformance with the following standard: EN61326-1(Basic radiated immunity).

Declarations of Conformity are held by GE Inspection Technologies GmbH:

GE Sensing & Inspection Technologies
GmbH Product Service Center
Lotzenäcker 4
72379 Hechingen Germany
Tel: +49(0) 74719882 0
Fax: +49(0) 74719882 16

Safety Mark

The XL Vu system is in compliance with the following standards: UL 61010-1, IEC 61010-1, EN 61010-1 and CSA-C22.2 No. 61010-1.

Additional Certification Testing

UN / DOT T1-T8

Canadian Notice

This equipment does not exceed the Class A limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Appendix

F. Creating a Personalized Logo File

The XL Vu allows users to display a personalized logo on-screen or store with captured images. Typically, this file will be a corporate logo.

LOGO File Requirements

- 200 x 200 pixels maximum size
- 24 Color
- File name must be logo.jpg
- File must be Microsoft® Windows® compatible

Creating the Logo File

1. Open logo file with image editor.
2. Create custom background comprised of Red 255, Green 0, Blue 255. This will create a magenta-colored background that will appear transparent when loaded on the XL Vu.
3. Save this file as a .png.
4. Close image editor.
5. Locate the saved file, right click, choose rename. Rename file from logo.png to logo.jpg. This will allow it to be recognized by the XL Vu.
6. Transfer file to the USB ThumbDrive provided with system.
7. Insert ThumbDrive into USB port on the XL Vu.
8. Press joystick to enter Live Main Menu
9. Navigate to SETUP > SCREEN/DISPLAY > LOGO
10. Select LOAD
11. Prompt will display “LOGO COPY COMPLETE”

Customer Support Centers

North/South America

721 Visions Drive
Skaneateles, NY 13152
Tel: 888-332-3848
315-554-2000 ext. 1

Europe

Lotzenäcker 4
72379 Hechingen
Germany
Tel: +49 (0) 7471 9882 0

Asia/Pacific

Unit 1602, 16/F Sing Pao Building
101 King's Road
North Point
Hong Kong
Tel: +852 2877 0801

E-mail: geit-info@ge.com

www.geinspectiontechnologies.com/en

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REGISTERED COMPANY