

Everest XLG3™ VideoProbe® System

Software Version 1.4

Operating Manual



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Operating Manual

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Service

To obtain service for your system, call one of the service centers below. If the problem cannot be corrected over the phone, you will be given a Return Materials Authorization Number (RMA) for shipment to the service center.

Always contact a GE Inspection Technologies service center for an RMA prior to returning any products for service or repair.

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About This Manual

This manual is written for visual inspection technicians who have a basic understanding of inspection principles and practices, and who are familiar with basic computer operations (such as using a mouse and managing electronic files and folders), but who may not have experience with a video borescope.

The manual provides a product overview, step-by-step procedures, and reference information. It does not include repair information.

To ensure operator safety, read and understand this manual before using the system.

Getting Help

Beyond this manual you can get product help in several ways:

- **Training**

Introductory in-person training is free with your system purchase. Additional training is available for a fee. Contact GE Inspection Technologies.

- **Phone**

For phone numbers, see [“Sales and Technical Support”](#) on page iii.

Frequent Tasks



Setting Up the System — Summary

For details, see [“Setting Up the System”](#) on page 27.

1. Open case's lids and front door.
2. Verify safe powering and grounding.
Inspect ground prong on power cord.
3. Connect to AC power, or attach battery.
4. Turn on power switch.
5. Remove insertion tube from storage reel.
6. Unwrap handset cable, and remove handset from case.
7. Install optical tip, accessories, and peripheral devices.



Capturing Images — Summary

For details, see [“Capturing Images and Videos”](#) on page 45.

1. Steer probe until desired view is displayed.
Position camera by moving joystick toward desired feature.
2. Freeze the image.
When desired image is displayed, press .
3. Save the image.
Press . Select **Return**. The image is saved.

Recording Video — Summary

For details, see [“Working With Videos”](#) on page 63.

1. Start recording video.
Press . Select **Start Recording**.
2. Stop recording video.
Press . Select **Video Record > Stop Recording**.

Putting the System Away — Summary

For details, see [“Putting the System Away”](#) on page 32.

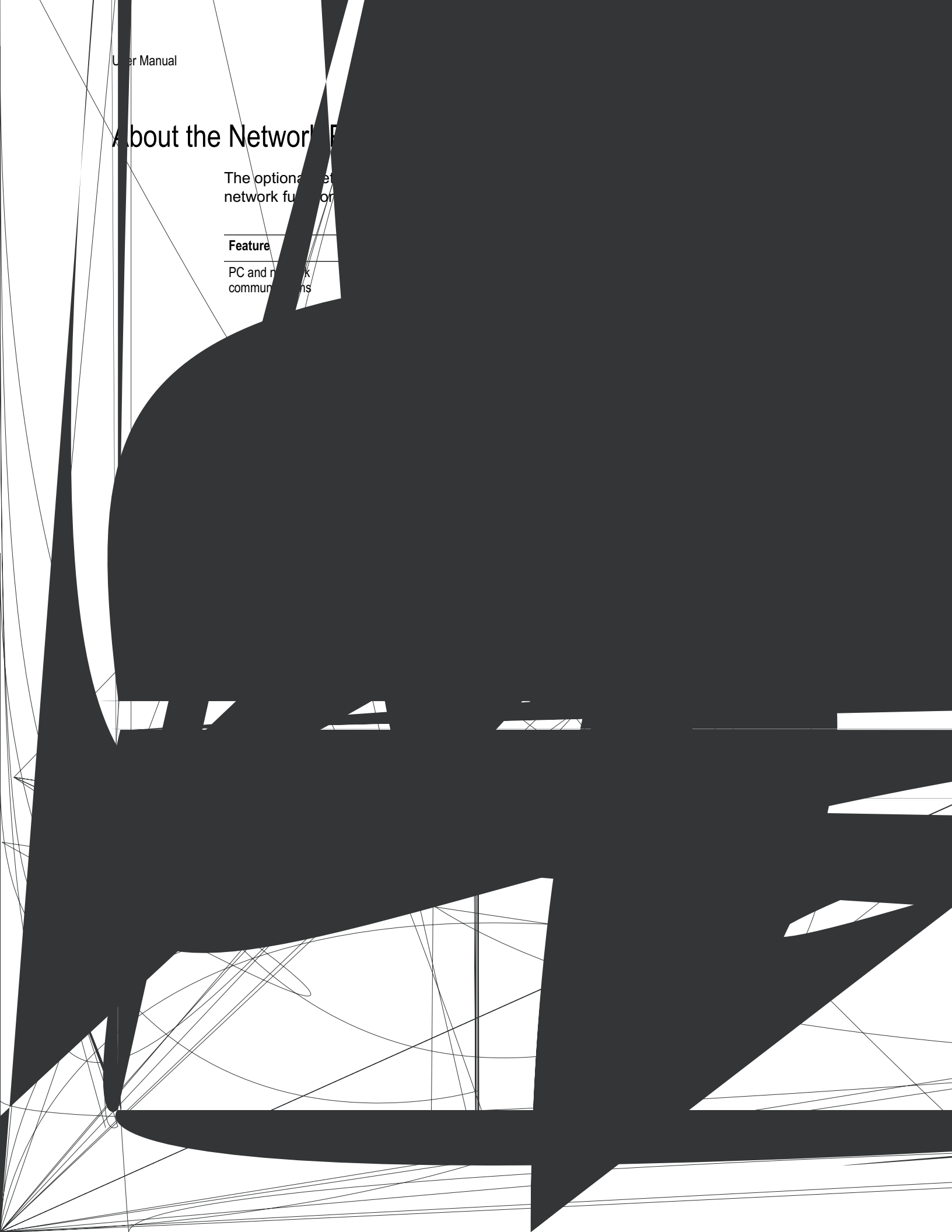
1. Straighten bending neck.
2. Turn off system, and disconnect from power source.
3. Detach peripheral devices and accessories.
4. Return insertion tube to storage reel, and wrap handset cable.
5. Store system and components in case.

About the Network Port

The optional network port provides network functionality for the device.

Feature

PC and network communications



About the Menu Directed Inspection Package

The optional Menu Directed Inspection package — which provides a *guided inspection* — where context is automatically added to images.

Feature	Description
Standardized Inspection List	<ul style="list-style-type: none"> • Inspectors follow standard list to describe images. • Support engineers and asset owners will receive reports with standard descriptions.
Consistent Reporting	<ul style="list-style-type: none"> • Provide on-site inspection report easily. • Automatically generate a report from XLG3 - images and context. • Eliminate after-the-fact reporting. • Control the look and feel and the descriptions for specific inspections.
Data Management	<ul style="list-style-type: none"> • Centralized, accessible asset health intelligence. • “Tagged” data available for archiving , trending, and analysis. • Eliminate manual consolidation of images and handwritten inspection data.
Remote Expert	<ul style="list-style-type: none"> • Move data not people. • Save time and money by getting information to inspection experts (not the other way around). • Quickly retrieve archived information using search criteria. • Easily share large amounts of visual images.
DICOM/DICONDE compliant	<ul style="list-style-type: none"> • Industry standard (non-proprietary) format provides maximum compatibility and flexibility for customers.

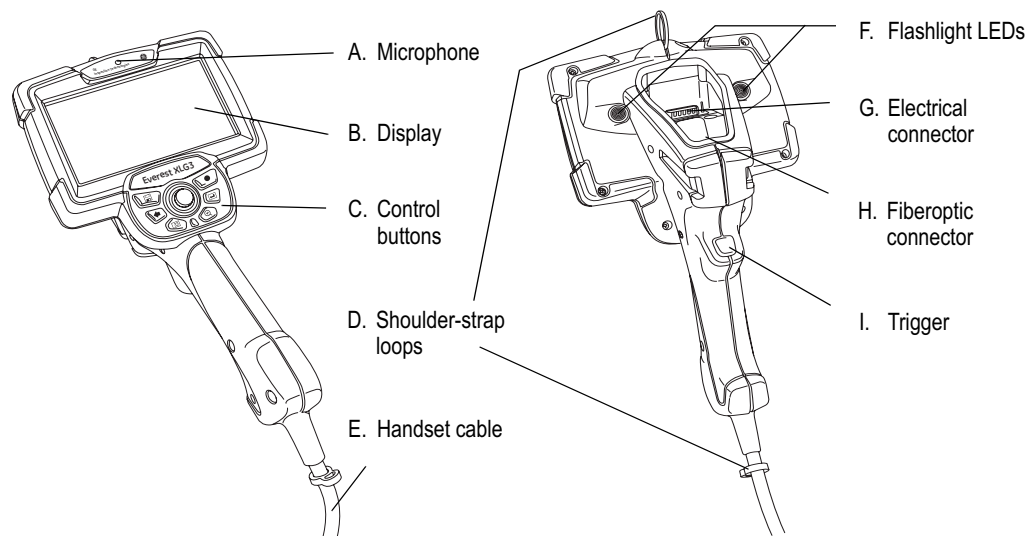
Controls, Indicators, Connectors, etc.


This section describes the controls, indicators, connectors, and other key elements for each main system component:

- “[Handset](#)” on page 7
- “[Control Buttons](#)” on page 8
- “[Probe](#)” on page 9
- “[Base Unit](#)” on page 10
- “[Case](#)” on page 14

Handset

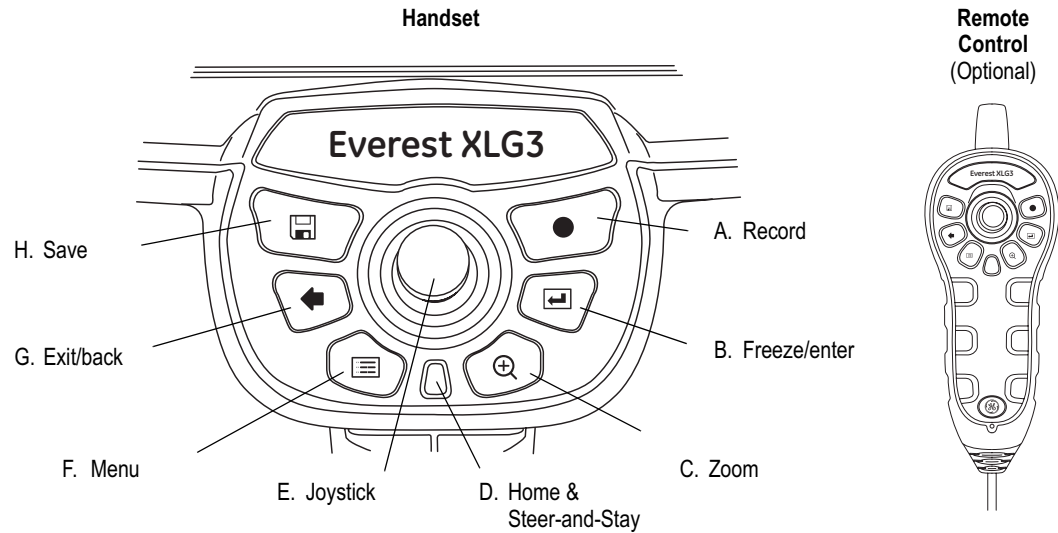
The handset is your interface to the XLG3 system.



Item	Description
A. Microphone	Lets you record voice comments for video or still images.
B. Display	Large, bright, high-resolution wide-VGA LCD screen.
C. Control buttons	For details, see “ Control Buttons ” on page 8.
D. Shoulder-strap loops	Strap is an optional accessory.
E. Handset cable	Plugs into the base unit. Powers the handset, enables communication with the base unit, and conducts light via a fiberoptic bundle from the lamp to the handset.
F. Flashlight LEDs	Provide light for reading or writing. See “ To Turn the Flashlight On and Off ” on page 29.
G. Electrical connector	Enables communication between base unit, handset, and probe.
H. Fiberoptic connector	Couples light to the probe.
I. Trigger	Same functions as the freeze/enter button  (item B. on page 8).

Control Buttons

The control buttons are conveniently located directly below the handset display. The same controls are available on the optional remote control.

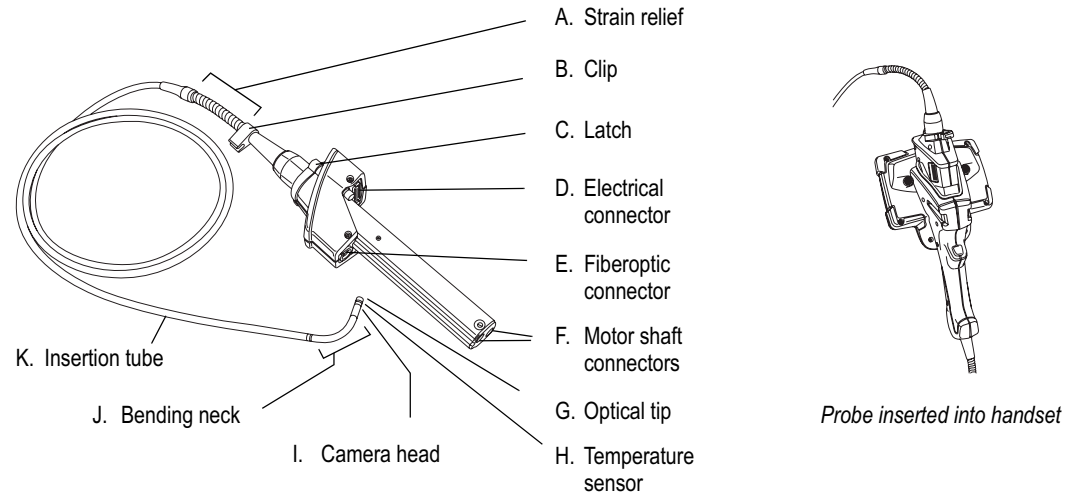



Item	Description
A. Record ●	Starts and pauses video recording. See "Working With Videos" on page 63.
B. Freeze/enter ←	Performs same functions as the trigger (item I. on page 7). <ul style="list-style-type: none"> Freezes and unfreezes images. Selects highlighted items.
C. Zoom ⊕	Changes the zoom level. See "Zooming" on page 56.
D. Home & Steer-and-Stay	Performs two functions: <ul style="list-style-type: none"> Home (press and hold). See "To Straighten the Bending Neck" on page 47. Steer-and-Stay (press quickly). See "To Hold the Bending Neck in Place (Steer-and-Stay Mode)" on page 47.
E. Joystick	Moves the probe tip, pans around zoomed images, moves through menus, and navigates the desktop.
F. Menu ☰	Opens and exits menus. See "Navigating the Menu" on page 15.
G. Exit/back ←	Exits a menu or operation.
H. Save 💾	Opens the save menu. See "Saving an Image" on page 61.

Probe

The probe is the flexible eye of the system.

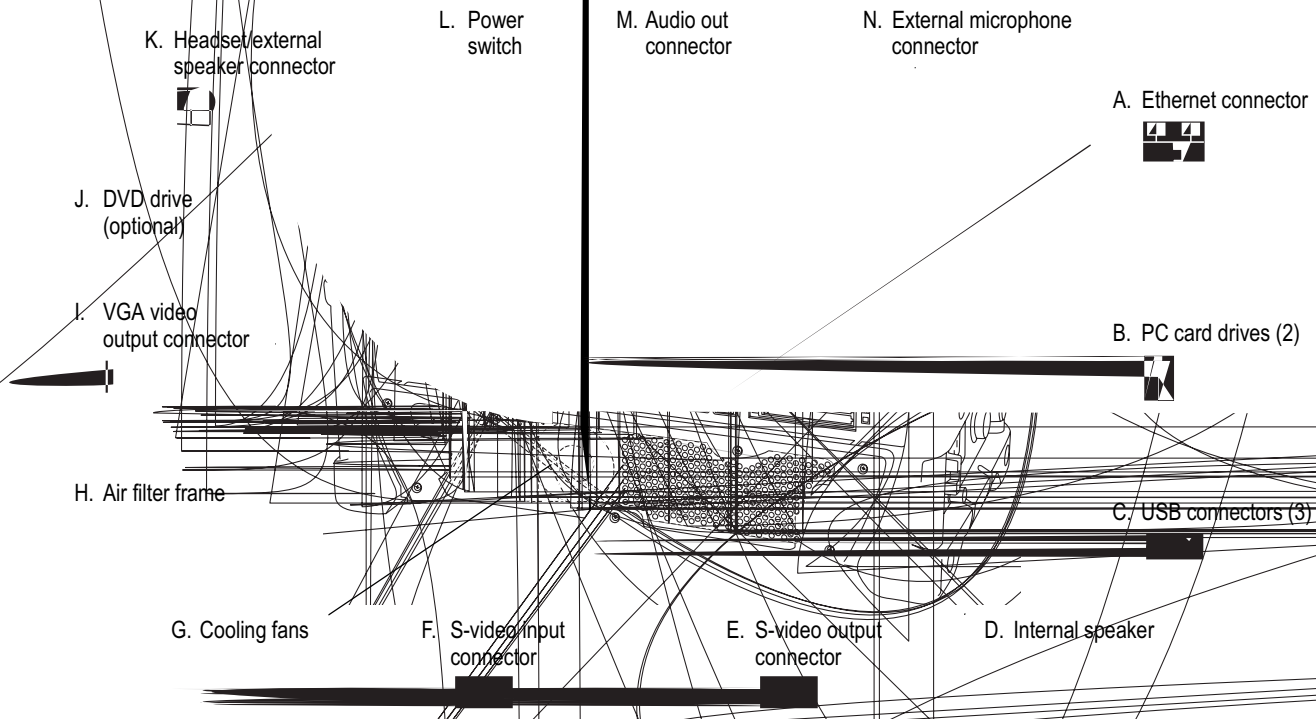
Various probe models are available with insertion tubes of different diameters and different lengths. You can change probes quickly. You can also travel lighter by carrying one system and a spare probe rather than a complete spare system.



Item	Description
A. Strain relief	Allows the insertion tube to twist up to 180 degrees in either direction.
B. Clip	Holds probe end when not in use.
C. Latch	C-shaped piece that locks the probe in the handset.
D. Electrical connector	Enables communication between base unit, handset, and probe.
E. Fiberoptic connector	Couples light from the handset into the insertion tube.
F. Motor shaft connectors	For controlling the articulation cables.
G. Optical tip	Removable part containing unique precision optics. For a list of available tips, see "Optical Tips" on page 141.
H. Temperature sensor	For 6.1 mm probes only. Displays a warning symbol and beeps when temperature at the probe tip approaches or exceeds operating temperature limits. For an example of the warning symbol, press  , and select Setup > Temp Sensor.
I. Camera head	Made of titanium for superior protection. Contains a high-resolution, durable camera that provides clear, true-color images.
J. Bending neck	The articulating section of the insertion tube.
K. Insertion tube	A woven tube of tungsten wire that protects the electrical conductors and the light-transmission fibers. Conducts light to the inspection area, and returns digital images.

Base Unit

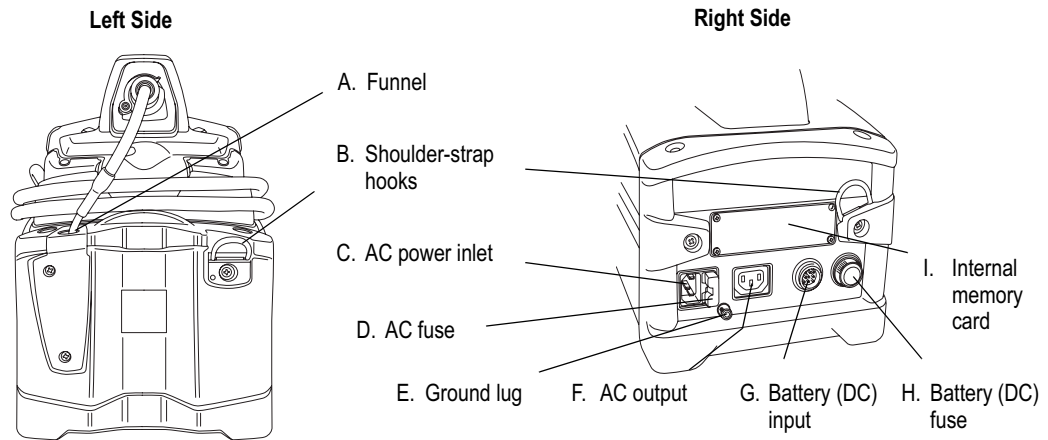
Base Unit, Front



Item	Description
A. Ethernet connector	For connecting to a PC or to the Internet with the optional network package.
B. PC card drives (2)	For saving images and videos. Both drives accept PC cards. Also accept adapters for various removable storage devices.
C. USB connectors (3)	For connecting various devices: a PC, a keyboard, a mouse, a memory stick, or other removable storage devices. All three connectors support USB 2.0 data rates and are compatible with USB 1.1 devices. You can connect or disconnect a keyboard or mouse any time.
D. Internal speaker	For playback of comments that were saved with images or videos. The menu-driven volume control affects this output.
E. S-video output connector	For connecting a cable to the "video in" connector of a peripheral device, such as an external monitor or recorder. S-video cables are available as accessories.
F. S-video input connector	For connecting a cable to the "video out" connector of a peripheral device, such as a camera. Allows the XLG3 system to capture, manipulate, annotate, and store images and videos from external sources. When the system detects external input, it displays that input automatically. S-video cables are available as accessories.
G. Cooling fans	For system ventilation.

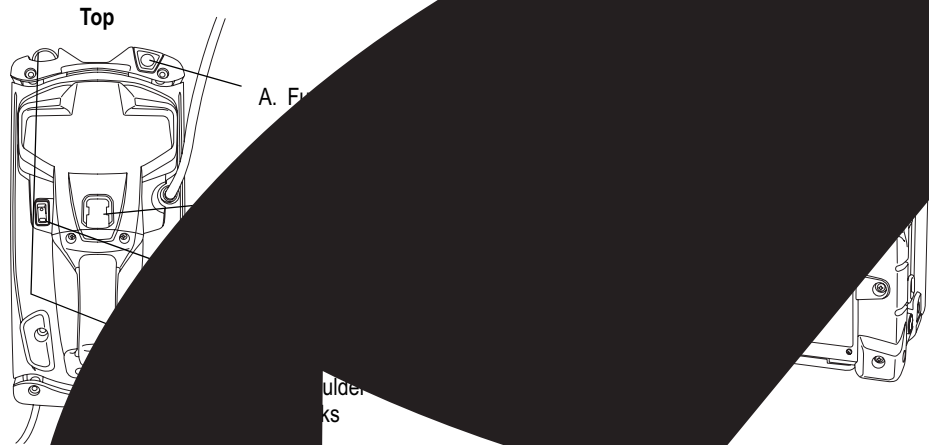
Item (cont.)	Description (cont.)
H. Air filter frame	For an optional air filter.
I. VGA video output connector	For connecting a PC-type monitor.
J. DVD drive (optional)	For storing video files.
K. Headset/external speaker connector	3.5 mm phone jack for a standard stereo headset or an external speaker. The menu-driven volume control affects this output. If headset is plugged in, the internal speaker is automatically disabled.
L. Power switch	Turns the system on and off.
M. Audio out connector	3.5 mm phone jack for a recording device (VCR, digital video tape recorder, etc.), or for powered speakers with their own volume control. Transmits line-level output signals (~2V RMS max). The menu-driven volume control does not affect this output.
N. External microphone connector	3.5 mm phone jack for a headset microphone or standalone microphone. An external microphone has the same function as the built-in microphone. When an external microphone is plugged in, the system automatically uses it for audio recording rather than the built-in microphone.

Base Unit, Sides



Item	Description
A. Funnel	Guides the insertion tube into the storage reel.
B. Shoulder-strap hooks	Strap is included.
C. AC power inlet	For connecting the power cord.
D. AC fuse	Protects the circuitry when using AC power.
E. Ground lug	Provides an earth ground if one is not available through the AC outlet.
F. AC output	IEC-type F connector. The voltage and frequency of the power available at the AC output is the same as the voltage and frequency applied to the inlet. Maximum output is 100 W.
G. Battery (DC) input	For connecting a battery (optional).
H. Battery (DC) fuse	Protects the circuitry when using a battery or other DC power source.
I. Internal memory card	Card is in the drive behind the access panel. This card contains the operating system software and the memory for storing images. This card is not user serviceable.

Base Unit, Top and Bottom



Item	Description
A. Filament	Provides the insertion tube into the storage reel.
B. Shoulder-strap hooks	Supports the handset holder.
C. Power switch	Turns the system on and off.
D. Shoulder-strap hooks	Strap is an optional accessory.
E. Battery connection points	For holding the optional battery in place. The bracket is part of the battery assembly.
F. Lamp	High-intensity discharge (HID) arc lamp, behind access panel.

Base Unit, Back



Item	Description
A. Handset power plug	Connects the handset cable to the base unit.
B. Lock screw ring	Latch that disconnects the power plug.
C. Pocket	Mesh storage pocket.

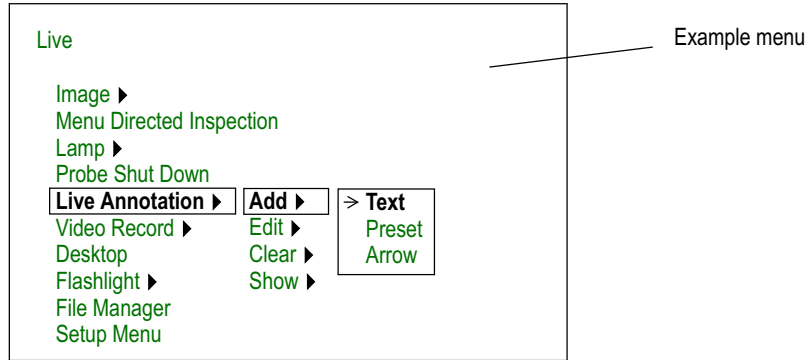
B. Rear latch (not visible here)

I. Socket for handset holder

Navigating the Menus

You can navigate the menus using the control buttons on the handset or remote control.

For complete menu structure, see “Menu Trees” on page 135.








Desired Type of Navigation	Control Button
To open a main menu	
To highlight an item	Joystick
To move between a parent menu and submenu or To change the highlighted option	Joystick
To select the highlighted item	
To exit menus	or

Safety Information





Before using or servicing the system, you must read and understand the following safety information.

Symbols and Terms

When the following symbols and terms appear *in this manual*, they have the following meanings:

Symbol	Term	Meaning
	WARNING	DANGEROUS VOLTAGE.
	WARNING	ELECTRICAL SHOCK HAZARD — PROPER GROUNDING REQUIRED.
	WARNING	Warning statements indicate conditions or practices that could result in injury or loss of life.
	Caution	Caution statements indicate conditions or practices that could result in damage to this product or other property.
	Caution	Surfaces may be hot.

When the following symbols appear *on the product*, they have the following meanings:

Symbol	Meaning
	Chassis grounding point.
	See accompanying documentation.
	Caution: Surfaces may be hot.
	Fuse. For continued protection against fire, replace fuse only with specified type and rating.

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.



WARNING ELECTRICAL SHOCK HAZARD — PROPER GROUNDING REQUIRED. For procedures, see [“Safe Powering and Grounding”](#) on page 23.



WARNING DANGEROUS VOLTAGE. The outer panels of the base unit should never be removed. Electrical shock hazard exists due to high internal voltage. There are no user serviceable parts inside the base unit, except for the lamp and fuses, which are accessible through the bottom and side panels, respectively. Refer all service to listed service centers.



WARNING DANGEROUS VOLTAGE. Because the insertion tube is conductive, and is connected to the base unit chassis and ground lug, do not allow the 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.



WARNING LAMP EMITS ULTRAVIOLET, INFRARED, AND INTENSE VISIBLE LIGHT. To prevent skin or eye injury, follow these instructions:

- Avoid looking at or touching the lamp and fiber bundle output while light is on.
- Do not operate the system when the handset is disconnected from the base unit.



WARNING POSSIBLE EXPLOSION HAZARD. Do not use this system in explosive environments.



WARNING USE PROPERLY. Using of 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 device in general. Caution statements that apply specifically to particular procedures appear in the corresponding sections of the manual.



Caution ALLOW ADEQUATE VENTILATION. Otherwise, the base unit might overheat. Do not cover or drape anything over the base unit. To ensure adequate airflow, provide a 3 inch (7.6 cm) distance between the base unit and any solid objects. When the base unit is installed in the case (the preferred configuration), the front door of the case must be open during operation to prevent overheating. It is recommended that you also leave the lids open.



Caution A LAMP MUST BE INSTALLED. Do not turn on the power switch without a lamp installed. Damage to the base unit may result.



Caution REMOVE POWER PROPERLY. To remove all power from the equipment, the disconnect device is the AC mains cord and, if equipped, the battery connector.



Caution 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 your ability to steer the probe tip. Avoid bending the insertion tube sharply; the fragile fibers contained inside may break. 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.








Caution CERTAIN SUBSTANCES MAY DAMAGE THE PROBE. For a list of substances that are safe for the probe, see [“Chemical Compatibility”](#) on page 131.

Informations sur la sécurité





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

Symboles et termes employés

Voici la signification des symboles et termes suivants employés **dans ce manuel** :

	AVERTISSEMENT	TENSION DANGEREUSE.
	AVERTISSEMENT	RISQUE DE CHOC ELECTRIQUE - RACCORDEMENT À LA TERRE OBLIGATOIRE.
	AVERTISSEMENT	Les avertissements préviennent de situations ou de pratiques risquant de provoquer des blessures, voire un danger de mort.
	Attention	Les mentions Attention préviennent de situations ou de pratiques risquant d'endommager le produit ou d'autres biens.
	Attention	Les surfaces concernées peuvent être brûlantes.

Voici la signification des symboles et termes suivants apposés **sur le produit** :

	Point de retour à la terre sur le châssis.
	Voir la documentation jointe.
	Attention: Les surfaces concernées peuvent être brûlantes.
	Fusible. Pour maintenir la protection contre les risques d'incendie, remplacer le fusible uniquement par un fusible du type et de l'ampérage spécifié.

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.



AVERTISSEMENT RISQUE DE CHOC ELECTRIQUE - RACCORDEMENT À LA TERRE OBLIGATOIRE. Pour les procédures, veuillez consulter la rubrique "Safe Powering and Grounding" en [page 23](#).



AVERTISSEMENT TENSION DANGEREUSE. Les panneaux extérieurs de la base ne doivent jamais être enlevés. Le risque de choc électrique est dû à la présence de tension électrique élevée dans l'unité. La base ne contient aucune pièce dont l'utilisateur puisse effectuer l'entretien ; les seuls éléments concernés sont la lampe et les fusibles qui sont respectivement accessibles par le panneau inférieur et le panneau latéral. Pour les opérations d'entretien, veuillez vous adresser aux centres de service indiqués.



AVERTISSEMENT TENSION DANGEREUSE. La gaine est conductrice et reliée au châssis de la base et à la borne de retour à la terre ; ne laissez pas l'appareil ni ses outils entrer en contact direct avec une source de tension ou d'intensité électrique. 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.



AVERTISSEMENT LA LAMPE ÉMET DES ULTRAVIOLETS, DES INFRAROUGES ET UNE LUMIÈRE VISIBLE INTENSE. Suivez les instructions ci-dessous pour éviter une blessure cutanée ou oculaire :

- Évitez de regarder ou de toucher la lampe ou l'extrémité du faisceau de fibres optiques lorsque la lampe est allumée.
- N'utilisez pas le système lorsque le manipulateur est déconnecté de la base.



AVERTISSEMENT RISQUE D'EXPLOSION. Ne pas utiliser ce système dans un environnement à risque d'explosion.



AVERTISSEMENT 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 en général. Les mentions Attention qui s'appliquent spécifiquement à des procédures particulières sont indiqués dans les sections correspondantes du manuel.



Attention PERMETTRE UNE VENTILATION ADÉQUATE. La base risque de surchauffer si elle n'est pas bien ventilée. Ne la recouvrez pas avec un tissu ou quoi que ce soit. Pour assurer un flux d'air adéquat, laissez un écart d'au moins 3 pouces (7,6 cm) entre la base et tout autre objet solide. Lorsque la base est installée dans son boîtier (configuration recommandée), le panneau avant de celui-ci doit être ouvert pour éviter la surchauffe de l'appareil pendant son utilisation. Nous vous recommander de laisser aussi les couvercles ouverts.



Attention UNE LAMPE DOIT ÊTRE INSTALLÉE. N'allumez pas l'appareil sans que la lampe soit en place. Cela risquerait d'endommager l'appareil.



Attention METTRE HORS TENSION CORRECTEMENT. Pour mettre l'appareil totalement hors tension, débranchez le cordon d'alimentation CA et le connecteur de batterie (le cas échéant).



Attention MANIPULER LA SONDE AVEC PRÉCAUTION. Maintenez la gaine de la sonde à l'écart d'objets pointus ou tranchants qui risqueraient 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 car les fibres optiques qu'elle contient sont fragiles et risquent de casser. Utilisez toujours le bouton de rangement pour redresser le collet avant de rétracter la gaine de la zone d'inspection ou de ranger la sonde. Ne manipulez jamais le collet 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.



Attention CERTAINES SUBSTANCES RISQUENT D'ENDOMMAGER LA SONDE. Pour consulter la liste des substances sans danger pour la sonde, voir [“Chemical Compatibility”](#) en page 131.

2 Safe Powering and Grounding

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Overview of Safe Powering and Grounding

Safe powering and grounding practices are the responsibility of the user.

In most cases, as described in this chapter, you must connect the system to a low-impedance earth ground before using it. With that connection, any stray voltage or static electrical charge on the equipment being inspected will be conducted safely to ground and will bypass the operator.



WARNING ELECTRICAL SHOCK HAZARD — PROPER GROUNDING REQUIRED.

In most cases, safe use of this product requires the presence of a protective earth ground path at the A/C power source. Use of two-conductor extension cords or any other action that may result in the loss of this ground path are in violation of the product's safe operating requirements.



WARNING INSPECTION OF ENERGIZED EQUIPMENT. If the equipment being inspected could be energized relative to earth ground, connect both the system and the equipment being inspected to earth ground. If that is not possible, connect the system either to earth ground or to the equipment being inspected, whichever the user needs to touch. The user should maintain personal electrical isolation from the other so as to avoid becoming a path to earth ground.

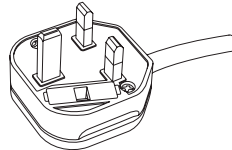
WARNING Before attempting any of the procedures in this chapter, carefully review all guidelines under [“Safety Information”](#) on page 16.

Verifying AC Earth Ground Path

In most cases when using an AC power source, safe use of the XLG3 system requires verifying a protective earth ground path.

To Verify AC Earth Ground Path

1. Verify that the plugs on the AC cable, and any extension cord, have a ground prong.



2. Use an ohm meter to measure the resistance from the ground prong to the base unit's ground lug to be sure that the AC cable is in good condition.

3. Verify that the AC outlet has a hole for the ground prong.



WARNING Do not use a three-prong grounded plug adapter in a two-prong wall outlet. Doing so could result in a shock.

4. If a good earth ground is not available through the AC outlet, connect an external ground wire to the base unit's ground lug, then connect the wire to earth ground or to the equipment being inspected.

A ground wire (part number XLG3AGROUND) is available from GE Inspection Technologies.



WARNING CONNECTING TO A VEHICLE INVERTER. If you connect the XLG3 system to a vehicle inverter, which converts a vehicle's 12-volt DC power to 110-volt AC, even if the inverter's power outlet has a ground plug, the XLG3 system is not necessarily earth grounded, since vehicles usually have rubber tires. You must still connect the base unit's ground lug to a proper earth ground and vehicle chassis. Failure to properly ground the base unit can result in a shock.

Grounding With a DC Source (Battery)

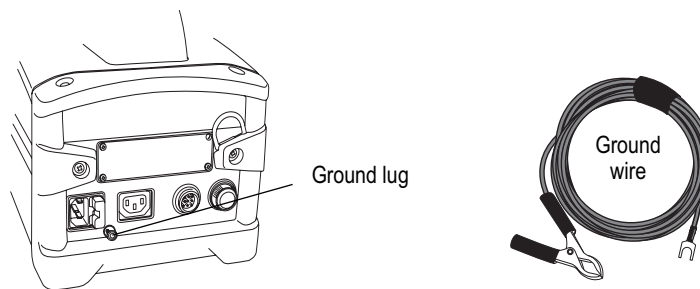
If you are using an external DC power source, such as the optional battery, while inspecting potentially energized equipment, safe use of the XLG3 system requires verifying a protective earth ground path.

To Provide DC Earth Ground Path

1. Connect an external ground wire to the base unit's ground lug.

A ground wire (part number XLG3AGROUND) is available from GE Inspection Technologies.

2. Connect the wire to earth ground or to the equipment being inspected.



Special Grounding Situations

Contact GE Inspection Technologies Technical Support for guidance prior to using the XLG3 system in any situation where the probe may come into contact with energized wires or parts.

For example, inspecting buried pipes that are electrically energized to prevent galvanic corrosion may require special grounding techniques.



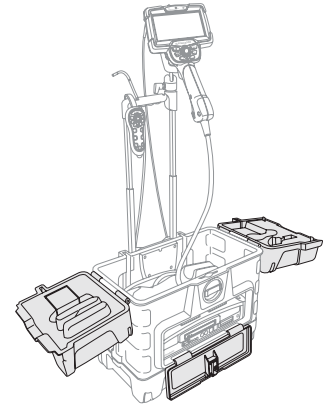
WARNING The XLG3 system and its working tools should never come in direct contact with any voltage or current source. Damage to the equipment or electrical shock to the operator may result.

3 Setting Up and Putting Away the System

Setting Up the System	27
Changing the Probe	30
Changing the Optical Tip	31
Putting the System Away	32
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Setting Up the System

1. Open the case's lids and front door.
Pull out and turn the front and back latches counterclockwise. Lift the center handle to open the first lid. Then open the other lid.
2. Determine whether to remove the base unit.
 - If possible, leave the base unit in the case.
 - If necessary for your application, remove the base unit.



Caution If you leave the base unit in the case, leave the front door open to prevent overheating. It is recommended that you also leave the lids open.

If you remove the base unit, verify that no accessories or cords are installed in any of the connectors on the front panel. Otherwise, damage might occur.

3. Verify safe powering and grounding. See [“Safe Powering and Grounding”](#) on page 23.
4. Connect to AC power, or attach battery.
 - If using AC power, plug the power cord into a grounded 110 or 220 VAC outlet.
 - If using battery for powering or backup, make sure battery is installed.
5. Turn on the power switch.

9. If using the system in a dusty environment, install a dust filter.

Slide the air filter between the perforated grill and the grill frame's five tabs.

10. If using any peripheral devices and accessories, attach them.


To Use the Base Unit Removed From the Case

Leave the handset face-down for carrying. Install the handset face-up for use. Slide handset holder into the socket next to the base unit's handle.

To Turn the Flashlight On and Off

While viewing a live image, press . Select **Flashlight > On** or **Off**.


To Turn the Lamp On and Off

While viewing a live image, press . Select **Lamp > On** or **Off**.

To maximize the life of the lamp, avoid frequent turning on and off.

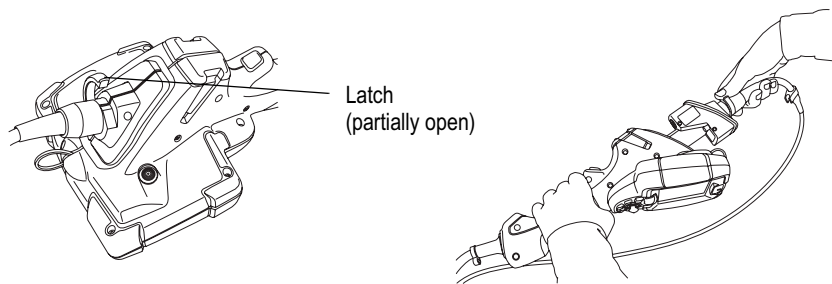
Changing the Probe

To Remove a Probe

1. Shut down the probe.
 - a. While viewing a live or frozen image, press .
 - b. Select **Probe Shut Down**.
2. Open the probe latch. The probe pops out slightly.
3. Gently slide the probe out of the handset.

To Install a Probe

1. Open the probe latch.
2. Slide the probe into the handset.
3. Close the latch.




Changing the Optical Tip

Optical tips are threaded onto the probe with a double set of threads to prevent them from falling into the inspection area. Each optical tip provides a unique depth of field, field of view, and direction of view. For a list of available tips, see [“Optical Tips”](#) on page 141.

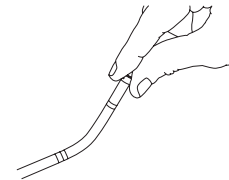


Caution Use only finger pressure to remove or attach tips. Using force — including pliers or other tools — might damage the bending neck. Take care not to cross the threads.

To Remove an Optical Tip

1. (Optional) Turn off lamp.
 - a. While viewing a live image, press .
 - b. Select **Lamp > Off**.
2. Grasp the head of the probe with one hand, and with the other gently turn the tip counterclockwise.

Turn until the tip spins freely, indicating that it has cleared the first set of threads.
3. Gently pull the tip forward (away from probe). Continue turning counterclockwise, engaging the second set of threads. Turn until you can remove it.



To Attach an Optical Tip

1. Verify that the optical tip is clean.
2. Grasp the head of the probe with one hand, and with the other gently turn the tip clockwise.

Turn until it spins freely, indicating that it has cleared the first set of threads.
3. Gently push the tip in. Turn clockwise again, engaging the second set of threads.

Turn until finger tight. Do not overtighten. Pull on the tip gently to verify that it is securely attached. If the second set of threads does not engage, turn the tip slightly in a counterclockwise direction to allow the threads to connect.

Note Measurement tips must be tightened firmly to ensure accuracy.

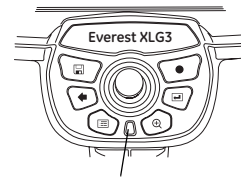
Related Information

- [“To Inspect and Clean an Optical Tip”](#) on page 111
- [“Optical Tips”](#) on page 141

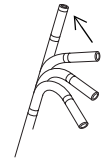
Putting the System Away

To Put the System Away

1. Press and hold the button just below the joystick. The bending neck straightens.
2. If any storage devices are in place, use the Eject Hardware menu command and then remove them.



Hold this button.



Home



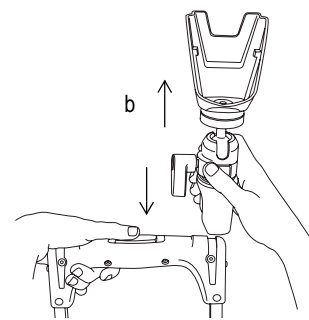
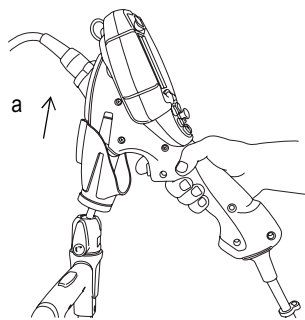
Caution Before removing storage devices, you must use the Eject Hardware menu command. For details, see [“To Eject a Storage Device Other than DVD”](#) on page 76.

3. Turn off the power switch, and disconnect power cord from the power source.
4. Detach any peripheral devices or accessories.
5. Remove the optical tip, and install the head guard.

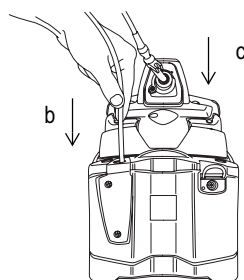


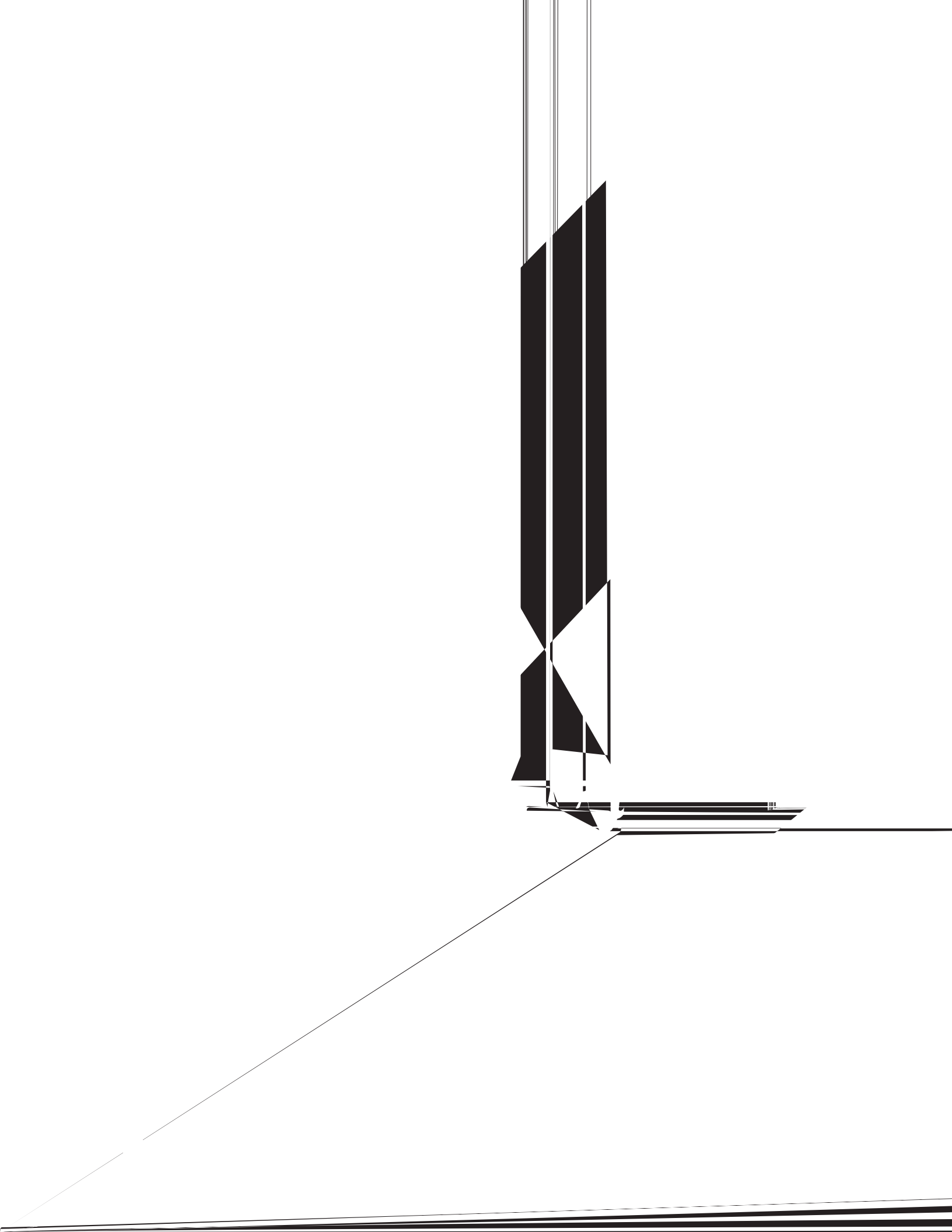
Caution The head guard prevents damage to the tip attachment mechanism. Keep the head guard on whenever no optical tip is in place.

6. Remove the handset and its holder.
 - a. Pull up on the handset, slightly twisting in either direction until it comes free.
 - b. Push the release button, and pull up on the holder.



7. Store the insertion tube in the base unit's internal storage reel.
 - a. Straighten any loops or twists in the insertion tube.
 - b. Feed the insertion tube as far as it goes into the funnel.
 - c. Place the handset face-down in the base unit's handle.






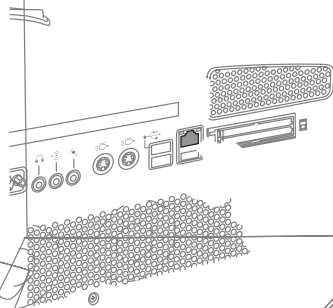
Connecting to a PC or Network

PC and network connectivity — wired or wireless — are part of the optional network package. (See “About the Network Package” on page 5.)

If the XLG3 system is connected to a PC or network, you can send images and videos to other computers for review, further manipulation, or remeasuring. You can also send images from other computers to the XLG3 system.

To Connect the XLG3 System to a PC or Network Via an Ethernet Cable

1. At the base unit, plug an Ethernet cable into the Ethernet connector .



2. Plug Ethernet cable into a network port.

The XLG3 Ethernet connector's LEDs light up to indicate that the connection is established.


3. If using a USB connector at the PC, install the USB 10/100 Ethernet Adapter software that came with the system.
4. If you want to work with XLG3 files on the PC (manipulate, remeasure, etc.), install the XLG3 version of iVIEW PC software on the PC. This application lets you manage and measure images that were captured by the XLG3 system. It also lets you create reports from those images.

No software is needed to simply share files with a PC or network via a direct Ethernet connection.



PC Based Re-Measurement iView - This application lets you manage and measure images that were captured by the XLG3 system. It also lets you create reports from those images. To download iVIEW PC, go to www.ge.com/inspectiontechnologies, and click **Download Center**.

No software is needed to simply share files with a PC or network via a direct Ethernet connection.

To Connect the XLG3 System to a Wireless Network

1. At the base unit, insert a wireless PC card into either PC card slot .

Use only a NETGEAR card for this purpose: manufacturer part number WG511T (GE Inspection Technologies part number XLG3A80211CARD).

2. Press . Select **Setup Menu > Communications > IP Address > Automatic**.
3. A checkmark appears next to **Automatic**.
4. Press . Select **Setup Menu > Communications > Wireless Configuration**.

The **WiFi Configurations** window opens.

5. Select **Detect**.

If the system detects any network access points, they appear now, listed under the **Auto Detect** tab

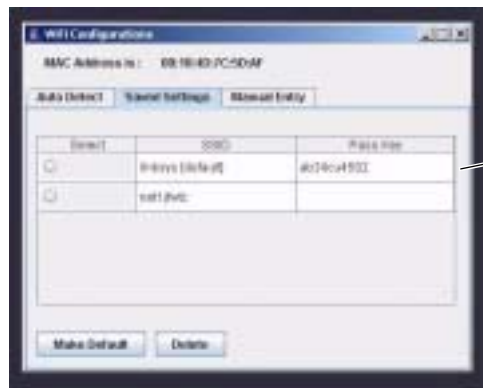
If the system is connected to a network using both an Ethernet connection and a wireless connection, the system will use the Ethernet connection by default.

6. Select or enter a network access point.

- If at least one access point is listed under the **Auto Detect** tab (shown above), select the desired access point. Select **Save and Make Default**.
- If no access points are listed, select the **Manual Entry** tab, as shown here. Under **SSID**, enter the name of the local access point. If a pass key is required for security, select **WEP**, and enter the pass key (from your network administrator.) Select **Save and Make Default**.
- If you want to see or manage the access points that have been saved, click the **Saved Settings** tab.



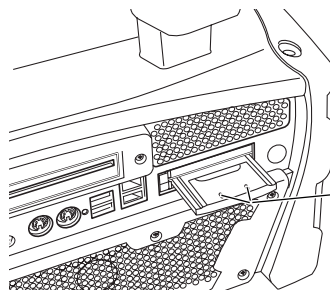
You can enter access points manually under the **Manual Entry** tab.



Up to five access points may be listed under the **Saved Settings** tab. If five access points are already saved and you want to use a different one, delete one from this list.

7. Wait until the PC card's two indicators blink simultaneously.

The system is now connected to the network.



Blinking simultaneously = connected
Blinking alternately = not connected

4 Setting Up the Software

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Reviewing Settings for Audio

Audio settings affect only audio output, not input. If you want to turn off audio input for video recording, you can do so before you start recording.

To Review Settings for Audio


1. Press .
2. Select **Setup Menu > Audio**.
3. Select the desired item:

Item	Description
Volume	Adjust the volume to the internal speaker and headphone output. This control does not affect line-level output.
Mic	On or off. When on, live audio is sent from the microphone to the line-level output, and audio is saved during video recording. When off, live audio is not sent to any outputs, and audio is not saved during video recording. The system still does save audio comments that you choose to record for still images.

Reviewing Settings for Image Format and Quality

If you want to choose the format or quality for a particular image you want to capture, you must change the setting before capturing that image.

To Change Settings for Image Format and Quality

1. Press .
2. Select **Setup Menu > Still Save**.
3. Select the desired settings:
 - **Save Format — JPEG or Bitmap**
 - **JPEG Quality — High or Low**

Stereo measurement JPEGs are always saved at high quality, even if this setting is **Low**.

Decision Factors for Image Format and Quality

When changing format and quality settings, consider these factors:

- which format is required or preferred
- (for JPEGs only) whether high or low quality is more appropriate
- how much storage space is available
- how many files (images and videos) need to be stored

This table may help you determine the best settings for your situation.

File Format and Quality	Typical File Size ^a	Storage Capacities (Approx. Number of Images) ^b	
		100 MB Internal Drive ^c	512 MB Removable Storage Device
BMP	900 KB	111	568
JPEG High	200 KB	500	2560
JPEG Low	60 KB	1666	8533

a. File size varies by image content. These sizes are based on typical NTSC images; PAL images are 10% larger.


b. Audio (WAV) files consume about 120 KB for every 15 seconds of audio. Image storage capacity must be reduced by the amount of audio recorded.

c. To learn how to check the available memory on your internal drive, see [“Reviewing Settings for the System”](#) on page 42.

Reviewing the Setting for Video Quality

If you want to choose the video quality, you must change the setting before you record. All videos are FMV (full-motion video) MPEG2 files.

To Change the Setting for Video Quality

1. Press .
2. Select **Video Record > Recording Options > MPEG Quality**.
3. Select the desired setting:
 - **MPEG2 High**
 - **MPEG2 Low**

Whenever you record to a PC card, videos are always saved at MPEG2 Low quality, even if this setting is MPEG2 High. If you record simultaneously to a PC card and a DVD, videos are always saved at MPEG2 Low quality to both media.

Decision Factors for Video Quality

When changing the video quality setting, consider these factors:

- which quality level is required or preferred
- how much storage space is available
- how many files (images and videos) need to be stored

This table may help you determine the best settings for your situation.

MPEG Quality	Typical File Size ^a	Storage Capacities (Approx. Number of Seconds) ^b		
		100 MB Internal Drive ^c	512 MB Removable Storage Device	4.3 GB DVD
MPEG2 High	1 MB/s	100 s	512 s	4300 s
MPEG2 Low	0.5 MB/s	200 s	1024 s	8600 s

- a. File size varies by image content. These sizes are based on typical NTSC images; PAL images are 10% larger.
- b. Audio files, which consume approx. 300 KB per second of video, are saved with video files.
- c. To learn how to check the available memory on your internal drive, see ["Reviewing Settings for the System"](#) on page 42. The available memory also appears on the Recording Options screen; see ["Recording Live Video"](#) on page 65.

Reviewing Settings for Text Color

You can change the color of text and other elements that are displayed over the images (for example, the dashed line that you center over the shadow when taking shadow measurements). The most legible color will vary with the coloring and brightness of the image.

To Change the Text Color

1. Press .
2. Select **Setup Menu > Graphics > Text Color**.
3. Select a color:
 - **White**
 - **Black**
 - **Green**


Reviewing Settings for a Logo

You can add a logo to the screen. You can use any graphics program to create the logo, as long as you save it with these attributes:

- Microsoft Windows-compatible
- 24-bit color
- 200 pixels x 200 pixels maximum
- file name *logo.bmp*
- transparent background color (if desired): red 128, green 128, blue 0

The system can store only one logo file.

To Work With a Logo

1. Insert the removable storage device that contains the logo file.
2. Press .
3. Select **Setup Menu > Graphics > Logo**.
4. Select the desired item:
 - **On** — Turns the logo on.
 - **Off** — Turns the logo off.
 - **Load** — Automatically installs the logo file from your storage device to the internal drive.

Reviewing Settings for Measurement


For XLG3 systems equipped with measurement capability, these settings determine system behavior when you are taking measurements. For details, see [“Measuring Features and Defects”](#) on page 89.

To Review Settings for Measurement

1. Press .
2. Select **Setup Menu > Measure**.
3. Change any desired settings.

Item	Description
Stereo	The Cal Info option displays calibration data for the selected stereo tip. All other options are for factory-authorized personnel only.
Shadow	The Cal Info option displays calibration data for the selected shadow tip. All other options are for factory-authorized personnel only.
Units	Inches, mm. Determines which units are displayed.
Set Min Index	Accuracy index's minimum value. If the index drops below this value, it flashes.
Index Display	On, off. Determines whether the accuracy index is displayed.
User Prompts	On, off. Determines whether user prompts are displayed in measurement mode. Only trained professionals should turn these prompts off.

Reviewing Settings for the System

1. Press .
2. Select **Setup Menu > System**.
3. Select the desired item:

Item	Choices	Description
System Info		System information appears: <ul style="list-style-type: none"> • Total memory capacity • Remaining memory • Software revision levels • Language
Language	Select	Choose from a list of languages.
	Load	System automatically installs a language file from an external storage device, if any. You must then select the language.
Time/Date	Show	On, off.
	Set	Change the time or date. Time is always in 24-hour format. Date is always in day/month/year format.
Steering	Tip Map	On, off. The tip map is a grid that indicates probe-tip position.
	Zoom Mode	Steer Only — In this mode, when you move the joystick in a zoomed live view, the probe tip articulates. The image changes as the camera moves. Pan Only — In this mode, when you move the joystick in a zoomed live view, the probe tip does not articulate. The image changes as the system electronically pans the camera's full view.
Distortion Values	Load	Loads new distortion correction parameters for an image.
Menu Directed Inspection	Prompt - On, Off	If on, the XLG3 will prompt you to begin MDI at startup.
MDI	Load, Unload	Annotate save images, load or unload an existing inspection on the XLG3.
Update Software		For use with the XLG3 Update Software CD-ROM or thumbdrive.
Feature Update		For use with the XLG3 Feature Installation CD-ROM or thumbdrive.
Video Output Format	NTSC	Standard in US and elsewhere.
	PAL	Standard in Europe and elsewhere.
LCD Display	Full	The image fills the screen. The top and bottom are cropped. There are no black bands at the sides.
	4x3	The complete image that the camera "sees" is displayed. The top and bottom are not cropped. There are bands of black at the sides.
	Unscaled	The image nearly fills the screen. The top and bottom are slightly cropped; there are narrow bands of black at the sides. Unscaled is automatically selected when measuring for most accurate placement of cursors.


Reviewing Settings for Communications

Communications settings are part of the optional network package. (See [“About the Network Package”](#) on page 5.)

The communications settings apply to XLG3 systems connected to a PC or network.

Note The XLG3 system is designed to operate in a protected computing environment behind a firewall.

To Review Settings for Communications

1. Press .
2. Select **Setup Menu > Communications**.
3. Change any desired settings.

Item	Choices	Description
Unit Name		Displays the system's serial number.
IP Address	None, Automatic, or Advanced	Displays the system's IP address and lets you select a setting. Select the setting recommended by your network administrator. Note: When establishing communications with a PC, the setting must be Automatic.
Remote File Access	Disallow	Prevents remote users from accessing files stored on the XLG3 system.
	Allow Read	Lets remote users read and copy files stored on the XLG3 system.
	Allow Read/Write	Lets remote users read and copy files stored on the XLG3 system and transfer files to the system.
Relink Now		Establishes communications between the network and a newly connected XLG3 system that was already turned on when you connected it.
Wireless Configuration		Displays wireless settings. Lets you select a wireless access point.
Video streaming	On/off	Lets remote users view live video. When video streaming is on, video cannot be recorded to the DVD drive.

5 Capturing Images and Videos

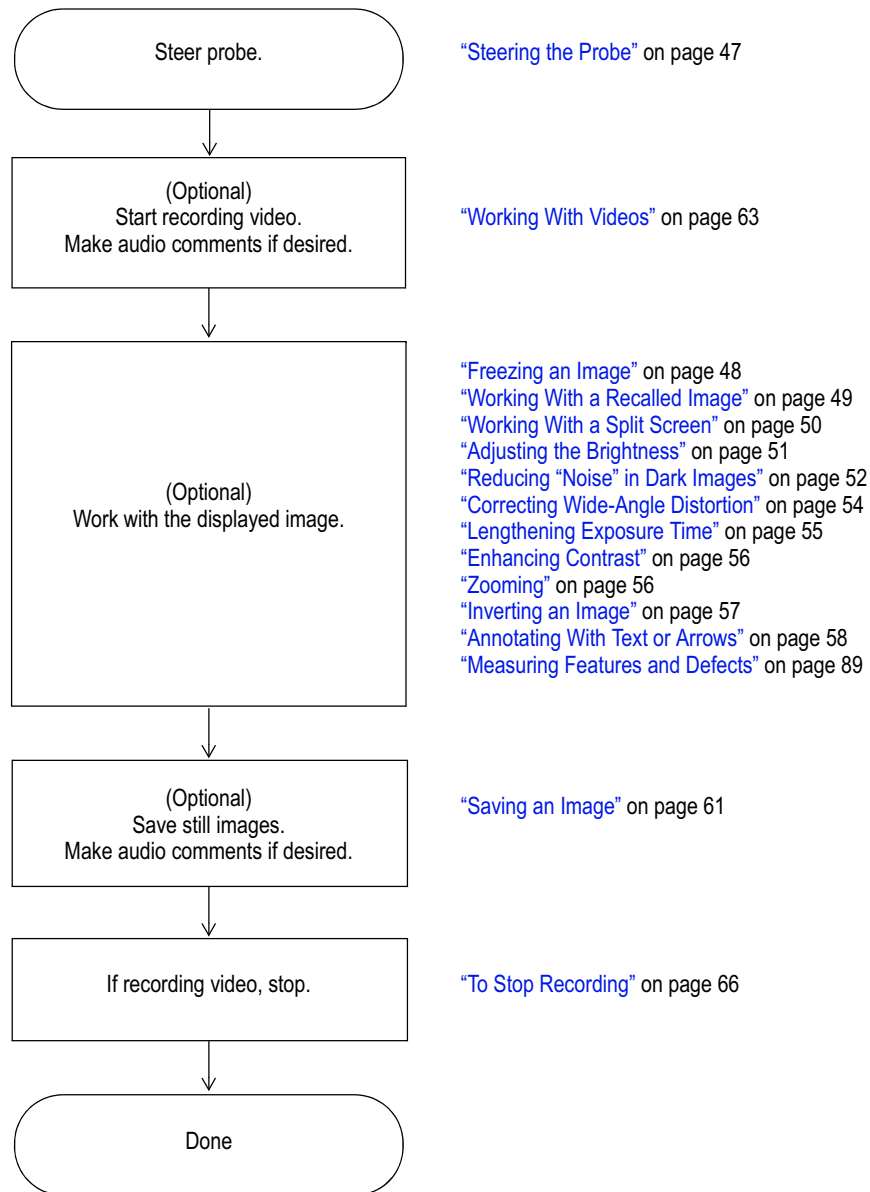
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Process Overview

The process of capturing images and recording videos may be simple or complex, depending on what you want to accomplish.

You can record audio comments for still images or videos using the built-in microphone in the handset, an external microphone, or a headset microphone.

For an illustration, see [“Process Diagram: Capturing Images and Videos”](#) on page 46.

Process Diagram: Capturing Images and Videos

Freezing an Image

Freezing an image captures it temporarily for review or adjustment.

When you move the joystick in a frozen view, the probe tip does not articulate. If you zoom in on a frozen image and then move the joystick, the image changes as the system electronically pans the camera's full view.

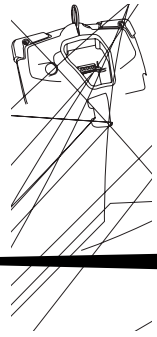
To Freeze an Image

Press **F** or the trigger.

The image freezes. The letters *FF* (for freeze frame) appear.


To Unfreeze an Image

Press **F**, or the trigger, or **ESC**.






Working With a Recalled Image

To Work With a Recalled Image

1. Recall the desired image.
 - a. Press .
 - b. Select **File Manager** > **Recall** > *drive or device*.
 - c. Select a file. It opens.

Note When viewing a recalled image, you can cycle through the other images stored in the same folder by moving the joystick.

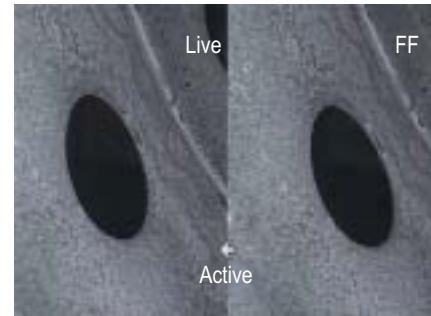
2. Determine your next action.
 - To rename the image, press . Select **Rename Image**. Enter a new file name. The new name overwrites the old.
 - To play recorded audio comments, if any, press . Select **Play Audio**.
 - To record comments, press . Select **Record (or Re-record) Audio**. Speak into the microphone.

For information on general tasks — adjusting brightness, zooming, annotating, saving, etc. — see [“Process Diagram: Capturing Images and Videos”](#) on page 46.

Working With a Split Screen

A split screen displays two images side-by-side in any combination of live, frozen, or recalled. Only one side is active at a time, as indicated by an arrow.

Still images in half-screen view are cropped horizontally. You can use the joystick to pan side-to-side within these images.



To Work With a Split Screen

1. Split the screen.

Press . Select **Image > Split Screen**.

On the left, a live image appears. On the right, the previous full-screen image appears at half-screen size. If it was previously live, it is now frozen.

2. (Optional) Change active sides, or temporarily view one image at full size.
 - a. Press .
 - b. Select **Split Options**.
 - c. Select any items:

Item	Description
Left/Right > Active	The selected side becomes active.
Left/Right > Full Screen	The selected side's image fills the screen.
	When finished viewing, press . Select View other image or Back to split screen

For information on general tasks — adjusting brightness, zooming, annotating, saving, etc. — see “[Process Diagram: Capturing Images and Videos](#)” on page 46.

3. When ready, exit the split screen.
 - To return immediately to a live image, press .
 - To select one of the displayed images to view upon exiting, press . Select **Split Options > Left/Right > Close**.

Adjusting the Brightness

You can adjust the brightness of live, frozen, and recalled images as well as recorded video.

When viewing live images, adjusting the brightness means controlling exposure time and camera gain. When viewing still images or recorded video, adjusting the brightness means controlling digital gain.

The brightness saved will be the brightness recalled.

To Adjust the Brightness

1. Press .
2. Select **Image > Brightness**.
3. Adjust.

Reducing “Noise” in Dark Images

Adaptive noise reduction is part of the optional image processing package. (See [“About the Image Processing Package”](#) on page 4.)

When the probe is in a dark area, the live image is often noisy, or grainy (“crawling pixels”). You can improve such images by turning on adaptive noise reduction (ANR) in either of two modes:

- ANR normal — Reduces noise without any brightening.
- ANR enhanced — Reduces noise and brightens dark areas. (Does not brighten areas that are already bright.)

Note ANR annotation is saved with image.



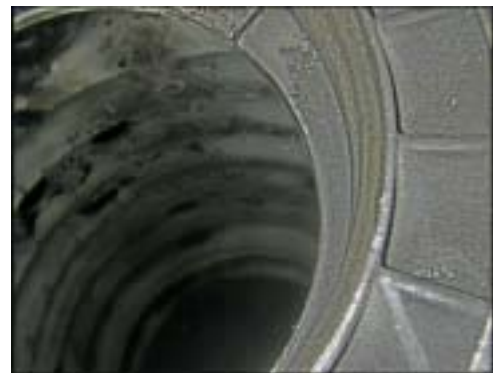
ANR off



ANR normal
(Noise is reduced without brightening.)



ANR off



ANR enhanced
(Noise is reduced and dark areas are brightened.)

To Turn On ANR

1. While viewing a live image, press .
2. Select **Image > Adaptive Noise Reduction > Normal** or **Enhanced**.

Note When ready to capture an image, keep the probe head as still as possible. When the probe head is moving, noise increases.

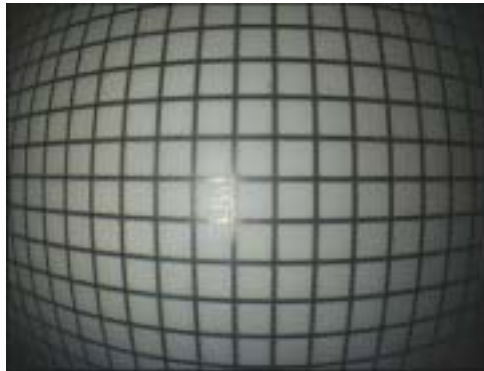
To Turn Off ANR

1. Press .
2. Select **Image > Adaptive Noise Reduction > Off**.

Correcting Wide-Angle Distortion

Distortion correction is part of the optional image processing package. (See [“About the Image Processing Package”](#) on page 4.)

When you use an optical tip with a 120° field of view, the image edges are distorted. You can improve such images by turning on distortion correction.




120° optical tip,
distortion correction off



120° optical tip,
distortion correction on

Note 120 Deg annotation on image is saved with the image.

To Turn On Distortion Correction

1. While viewing a live image with a 120° optical tip installed, press .
2. Select **Image > Distortion Correction > 120 Deg**.

Note If you enter a measurement mode, a corrected image reverts to its uncorrected state for accuracy.


To Turn Off Distortion Correction

1. Press .
2. Select **Image > Distortion Correction > Off**.

Lengthening Exposure Time


One way to brighten live images is to lengthen the camera's exposure time. The XLG3 system can vary the exposure time from 1/10,000 second to 12 seconds. The longer the exposure, the greater the risk of blurring the image. Keep the probe tip as still as possible when capturing an image with a long exposure.

To Lengthen Exposure Time

1. While viewing a live image, press .
2. Select **Image > Long Exposure**.
3. Select the type of long exposure you want.
 - **Auto** — The system sets the exposure time.
 - **Manual** — You set the exposure time. Move the joystick until the image is as light as you want it.

Lg Exp appears.

To Turn Off Long Exposure

Press .

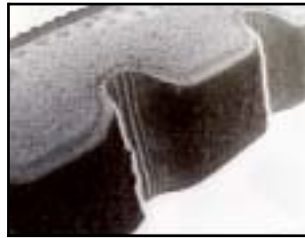
Enhancing Contrast

When there is not enough light or contrast to see important features or defects — for example, when you need to position cursors accurately for measurements — “Inverse +” may help. This feature reverses the brightness like a photographic negative. It enhances the image contrast, making subtle details more visible.

You can enable “Inverse +” for any live, frozen, or recalled image.




“Inverse +” off




“Inverse +” on

To Turn “Inverse +” On

1. Press .
2. Select **Image > Inverse + > On**.

To Turn “Inverse +” Off

Press .

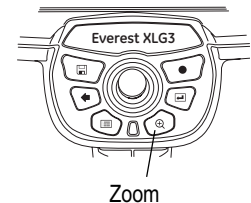
Zooming

You can zoom in and out for all types of images: live, frozen, and recalled.


Zooming is digital, so pixelation increases as you zoom in.

The system cycles through the zoom levels in increments up to 3.0x. When an image is zoomed, its zoom level (for example ZM 2.6) appears on the screen.

To learn about the two zoom modes, which determine what happens when you move the joystick in a zoomed live view, see [“Reviewing Settings for the System”](#) on page 42.



To Zoom

Press .

For larger increments, press  repeatedly. For smaller increments, hold .

To Unzoom

Press .

Invert

ction flips an image horizontally. You can invert a live, frozen, or recalled



Annotating With Text or Arrows


Annotating an XLG3 image means adding text or arrows to point out areas of interest: cracks, defects, etc. You can annotate live, frozen, and recalled images.

You can create two types of annotation:

- **Live annotation** is general information — relevant to the entire inspection or a significant portion of it — to be displayed constantly except when hidden. You can show or hide live annotation any time. You would use live annotation, for example, while recording video. To add or clear live annotation, you must be viewing a live image. When you're viewing a still image, you can choose whether to show or hide the live annotation.
- **Still annotation** is information that is specific to a particular image. To display or add still annotation, you must be viewing a still image (frozen or recalled). When you return to a live image, still annotation is cleared.


If you anticipate using certain text over and over, you may want to create one or more *presets* — ready-to-use annotations. You can create multiple presets for use in either live or still annotations. Maximum = 40 presets, 5 lines per preset, 28 characters per line.

To Annotate a Live Image

1. Press .
2. Select **Live Annotation**.
3. Select the desired item:


Item	Choices	Description
Add	Text	Create text for use in a live annotation.
	Preset	Select, create, edit, or delete text presets.
	Arrow	Create an arrow for use in a live annotation.
Edit	Text	Edit existing live text annotations.
	Arrows	Edit existing live arrow annotations.
Clear	Text	Deletes all live annotation text from the screen and from memory.
	Arrows	Deletes all live annotation arrows from the screen and from memory.
Show	On, Off	Turns live annotation (text and arrows) on or off.

To Annotate a Still Image

1. Press .
2. Determine whether to display or hide live annotation, if any.
Select **Live Annotation > Show > On or Off**.
3. Select **Still Annotation**.
4. Select the desired item.

Item	Choices	Description
Add	Text	Create text for use in a still annotation.
	Preset	Select, create, edit, or delete text presets.
	Arrow	Create an arrow for use in a still annotation.
Edit	Text	Edit existing still text annotations.
	Arrows	Edit existing still arrow annotations.
Clear	Text	Deletes all still annotation text from the screen and from memory.
	Arrows	Deletes all still annotation arrows from the screen and from memory.
Show	On, Off	Turns still annotation (text and arrows) on or off.

Note In addition to annotating with text and arrows, you can also add audio comments to a still image in either of two ways:

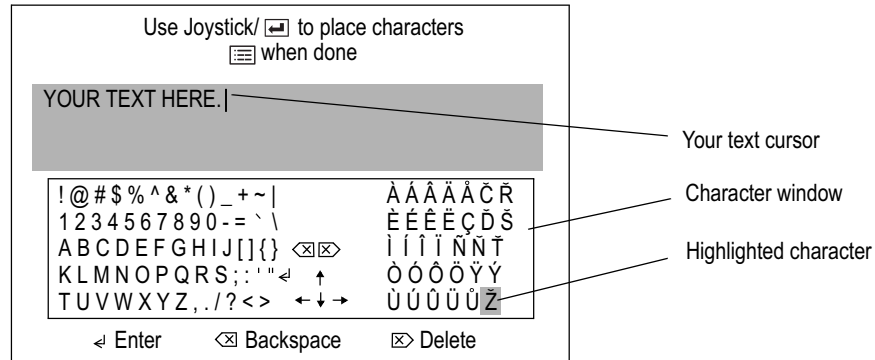
- Immediately after saving an image, you can select **Record Audio**.
- If viewing a recalled image, you can press , and then select **Audio > Record Audio**.

Note Changing the display size will change annotations location and may cause annotation to be cut off.

To Use the Text-Entry Screen

You use the text-entry screen when creating an annotation or preset.

Note For faster text entry, you can use a USB keyboard.



1. If necessary, position your text cursor.
 - a. Move the joystick to highlight an arrow key $\leftarrow \uparrow \rightarrow$ in the character window.
 - b. Press \leftarrow on the handset. Your text cursor moves in the selected direction.
 - c. Repeat until your text cursor is in the desired position
2. Move the joystick to highlight the desired item in the character window.
 - If you want to add a character, highlight that character. For a space, highlight any blank.
 - If you want to start a new line, highlight \leftarrow .
 - If you want to delete a character, highlight \leftarrow or \rightarrow .
3. Press \leftarrow on the handset to activate the highlighted item.
4. Repeat from Step 1 until you are finished creating your annotation.
5. Press $\left[\equiv\right]$. The text-entry screen disappears. Your text is displayed.
6. Determine what to do next.
 - If you have just created an annotation, move it to the desired location.
 - If you have just created a preset, follow the on-screen instructions.

Saving an Image

Saving an image is like taking a snapshot. Most screen elements — date, time, zoom level, annotations, measurements, etc. — become part of the saved image. What you see is what you save.

You can save live, frozen, split-screen, or recalled images.

There are two save modes:

- **Normal**

Saves the image without calibration data. When you recall a normal image, you cannot take measurements.



- **Measurement**

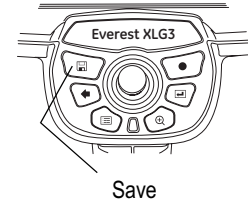
Saves the image with calibration data for the selected measurement tip. When you recall a measurement image, you can take measurements.

Related Information

- [“To Save an Image”](#) on page 62
- [“Reviewing Settings for Image Format and Quality”](#) on page 38
- [“Managing Files & Communicating With Other Computers”](#) on page 75

To Save an Image

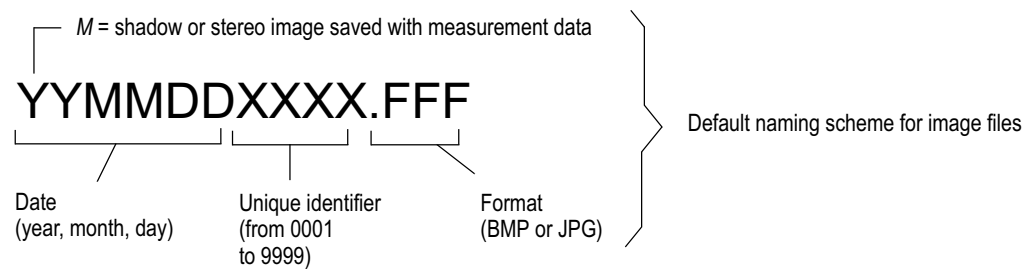
1. (Live or still images) Press .
-or-
(Still images only) Press . Select **Save** or **Save Image**.
2. If the choice is available, select **Normal** or **Measurement**.
3. Select the desired option or options.



Option	Description
Save	Saves the image file.
Select Save Folder	Lets you select a save folder before you save the file. If you insert a storage device after selecting this menu item, select Refresh Drive List to update the list of choices.
Eject Hardware	(Applicable only for removable storage devices.) Ejects the storage device.
Rename Image	Lets you name the file before you save it. If you do not name the file before saving it, the system assigns a name.
Record Audio	Lets you speak into the microphone to record comments.
Play Audio	Plays recorded comments, if any.
Delete Audio	Deletes recorded comments, if any.

About Image File Names

Unless you name the image before saving, image files are named automatically. You can rename them after recalling them, or you can rename them any time from the desktop.



Working With Videos

Any time during your inspection you can record video “in the background” while doing other tasks, such as adjusting brightness, comparing images on a split screen, capturing still images, taking measurements, managing files and folders, etc.

When you record video, the XLG3 system saves everything that appears on the display, including menus that you open, as well as background sounds and comments made near the microphone (unless you turn off the audio).

You can record video onto the internal drive, a DVD, or any other removable storage device.

Related Information

- [“About DVDs”](#) on page 64
- [“Recording Live Video”](#) on page 65
- [“Working With a Recalled Video”](#) on page 68

About DVDs

The optional DVD drive can be used for two purposes:

- to record live MPEG2 video files
- to archive saved files (images or videos)

Do not turn off the system while recording or archiving to a DVD, or you will lose data.

When video streaming is on, video cannot be recorded to the DVD drive. To learn how to turn video streaming on and off, see [“Reviewing Settings for Communications”](#) on page 43.



Caution DVD recording and archiving are sensitive to extremes of temperature, dust, vibration, and shock. For best results, minimize these factors.

DVD Types Accepted

The XLG3 system accepts both DVD+Rs and DVD-Rs.

- **DVD+R:** Accepts up to a total of 14 pauses, stops, and/or archiving sessions.
- **DVD-R:** Accepts up to a total of 35 pauses, stops, and/or archiving sessions.

You can record and/or archive to the same DVD multiple times until it is full, or until you reach the maximum number of pauses, stops, and/or archiving sessions.

Initializing DVDs

Before you can record or archive to a DVD, it must be initialized (prepared to accept files). If you start recording or archiving to a new DVD that has not been initialized manually, the system automatically initializes it before recording or archiving.

To Initialize a DVD Manually

1. Press
2. Select **Video Record > DVD Initialize**.

The system initializes the DVD for about 2 minutes. After the DVD is initialized, you can start recording or archiving whenever you are ready.

Related Tasks

- [“Recording Live Video”](#) on page 65
- [“Archiving \(Copying\) Files to a DVD”](#) on page 79
- [“To Eject a DVD”](#) on page 76

Recording Live Video

Before recording video to a DVD, read [“About DVDs”](#) on page 64.

To Start Recording, Using Menus

1. Press  quickly.

- or -

Press . Select **Video Record > Recording Options**.

The Video Recording Options menu appears.

2. Select the desired option or options.

Option	Description
Start Recording	A flashing red dot appears. As long as this dot is flashing, the system is recording. If using a DVD, recording starts only after the DVD drive light stops flashing. If you start recording to a new DVD that has not been initialized manually, the system automatically initializes it before recording. See “Initializing DVDs” on page 64.
Cancel	Exits the menu without recording.
MPEG Quality	MPEG2 High or MPEG2 Low. For decision factors, see “Reviewing the Setting for Video Quality” on page 39.
Mic	On or off. When off, no audio is recorded.
Select Drives	Lets you select the drive or drives to record to. When you record to a DVD, it is recommended that you select a backup drive for simultaneous recording. When you record to the PC card slot, special considerations apply: <ul style="list-style-type: none"> • The PC card adapter must be in the top PC card slot, and it must be a Delkin adapter, manufacturer part number DDCARDBUS-AD (GE Inspection Technologies part number XLG3APCADAPTOR). • If you use a compact flash card, it must be an industrial card. • Videos are always saved to the PC card slot at MPEG2 low quality, even if you select MPEG2 high. • If you record simultaneously to the PC card slot and a DVD, videos are always saved at MPEG2 low quality to both media.
Select Save Folder	(For any drive other than DVD) Lets you select a save folder on the selected drive.
Name Video	Lets you name the file before recording. If you do not name the file before recording, the system assigns a name.

To Quick-Record, Bypassing Menus

Press and hold ●.

A flashing red dot appears. As long as this dot is flashing, the system is recording. If using a DVD, recording starts only after the DVD drive light stops flashing. If you start recording to a new DVD that has not been initialized manually, the system automatically initializes it before recording. See “Initializing DVDs” on page 64.

To Pause Recording

1. Press ● quickly.

- or -

Press . Select **Video Record > Pause**.

Recording stops temporarily. The pause symbol appears: **||**

2. When ready to resume, press ● again.

- or -

Press . Select **Video Record > Resume Recording**.

The red dot flashes again. Recording resumes.

Note Each time you pause and then resume video recording, the system continues saving to the same MPEG file. If you are recording to a DVD, the first pause or stop takes about a minute to process. The total number of times you can pause and stop varies with DVD type. See “[DVD Types Accepted](#)” on page 64.

To Stop Recording

Press and hold ●.

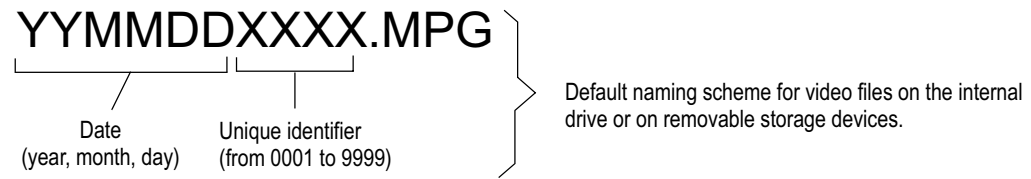
-or-

Press . Select **Video Record > Stop**.

Note Each time you stop recording, the system creates a separate MPEG file. If you are recording to a DVD, the first pause or stop takes about a minute to process. The total number of times you can pause and stop varies with DVD type. See “[DVD Types Accepted](#)” on page 64.





About Video File Names




Unless you name the video before recording, video files are named automatically. You can rename them after recalling them, or you can rename them from the desktop.



Working With a Recalled Video





To Work With a Recalled Video

1. If recalling a video from a DVD, verify that the DVD drive is selected.
Press . Select **Video Record > Recording Options > Select Drives > DVD**.
2. Recall the desired video.
 - a. Press .
 - b. Select **File Manager > Recall > drive or device**.
 - c. Select a video. It begins to play.
3. (Optional) Determine your next action.
 - Rename the video file.
Press . Playback pauses, and the Recalled Video menu appears. Select **Rename**. Enter a new file name. The new name overwrites the old. (Select **Play** to resume playback.) Note: Video files on a DVD cannot be renamed.
 - Capture a still image from the video.
Press . Playback pauses, and the Recalled Video menu appears. Select **Save Still Image**. Enter a file name. The paused image is saved as a JPEG or bitmap, depending on the settings. (Select **Play** to resume playback.)
 - Control playback by using the control buttons:




Playback Option	Control Button
Pause.	 or trigger
Resume playback when paused.	 or trigger
Fast-forward.	Pause then joystick right
Rewind.	Pause then joystick left
Close video.	

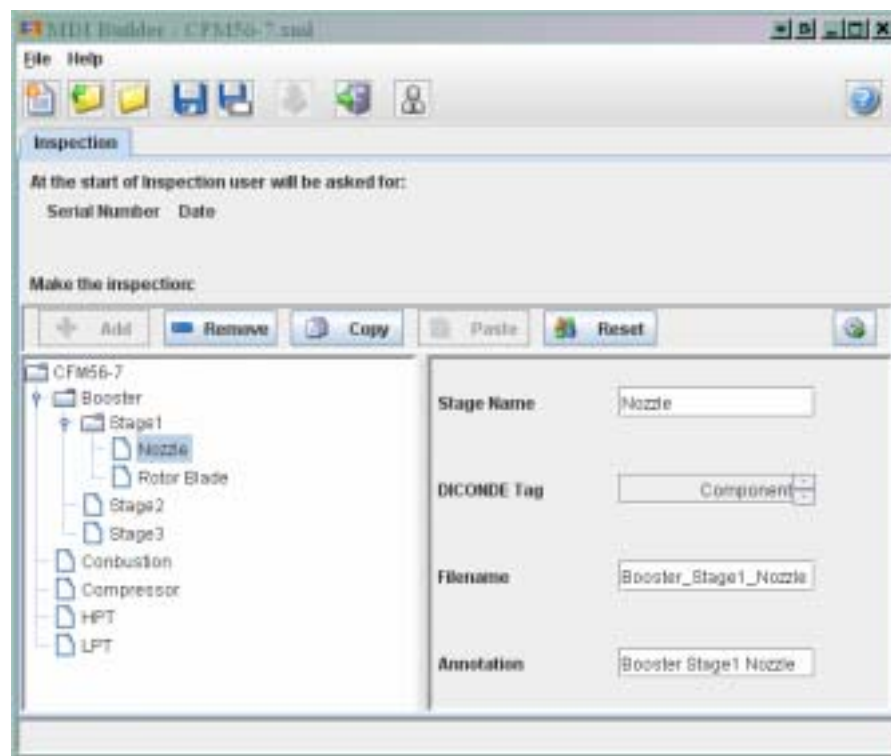
MDI Basic Operation

Make Inspection

1. Double-click the  **MDI Builder** icon on the desktop of either the PC or the XLG3™ VideoProbe® ( **MENU** > **Desktop** >  **ENTER**)
2. Create a new inspection: Click the  **NEW** button.
3. Enter the inspection name in the **Name of inspection** text box.

Note Inspection name must be less than ten characters, and cannot contain special characters. Text in the tree will turn red if requirements are not met


4. Click the  **Add** button to enter a new inspection level. Enter the desired name in the Name text box.
5. To add a sub-branch to a desired inspection level, click the  **Add** button.
6. To save the inspection, click the  **SAVE** button.





Load Inspection


Load an inspection created with MDI Builder (PC) or transfer an inspection from one XLG3™ VideoProbe® to another.



Run Inspection








Use an inspection created on the XLG3™ VideoProbe®, PC or a demo inspection. Follow the instructions below for conducting an  MDI Inspection on the XLG3™ VideoProbe® unit.

1. Press the  **MENU** button.
2. Open an inspection: Use the Joystick to select the desired inspection. Press  **ENTER** to confirm.

Note If no inspection is listed, an inspection must first be exported.

3. Enter serial number or additional inspection data. Use the external keyboard to enter text. The tab key advances the active text box; the arrow keys will move the cursor along the text box.
4. Save to the appropriate drive.
5. Select an inspection point: Use the Joystick to select and press  **ENTER** to confirm.




Note To go back a level press and hold the  **BACK** button. To advance a level, press the  **ENTER** button.

6. Move the video probe to the location that matches the corresponding location described in the upper left-hand corner of the video screen.
7. Make any image adjustments and/or measurements as needed.
8. Save the image: Press the  **SAVE** button and use the Joystick to choose the save method. Press  **ENTER** to confirm.
9. Continue the inspection: Press the  **MENU** button and locate the inspection name in the menu list. Select the **CONTINUE** button and press  **ENTER** to confirm.
10. Repeat steps 5 through 8 until inspection is complete.
11. To stop the report, press the  **BACK** button until the **CANCEL** option is available in the  **MDI Inspection interface**. Press  **ENTER** to confirm.



Generate Report

A report can be created once an inspection has been completed and stopped.

1. Press the  **MENU** > **Menu Directed Inspection** > **Generate Report**.
2. Select the Drive Containing the Inspection: Select with the Joystick and press  **ENTER** to confirm.
3. Locate the Inspection: Inspections are filed in the location specified in the first text entry box at the beginning of the inspection.
4. Select the Inspection: Use the Joystick to select the correct folder. Press the  **ENTER** button to accept.

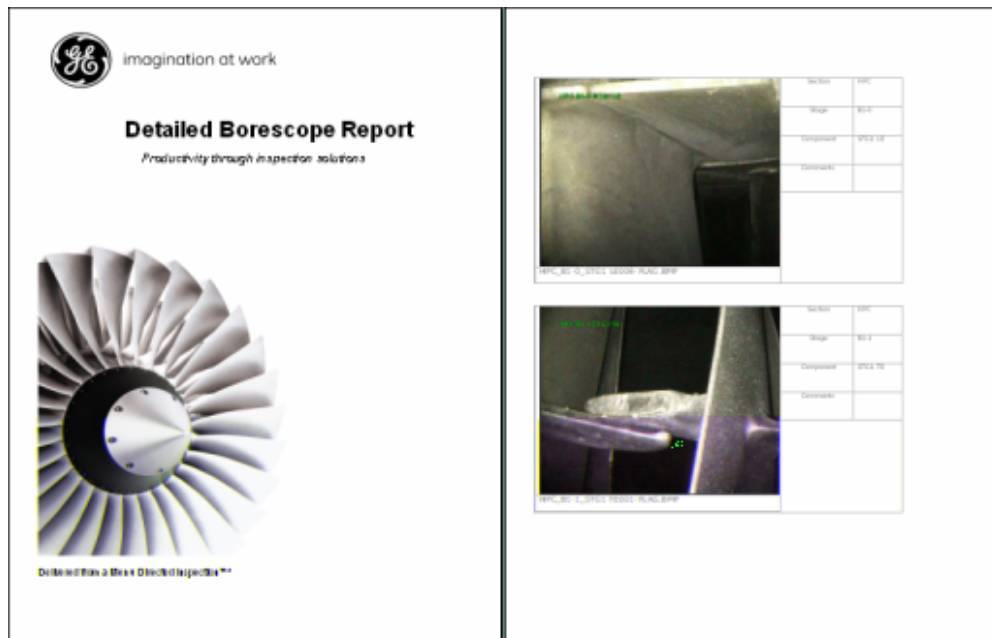
- Note**
- Reports can not be edited from the **XLG3™ VideoProbe®** unit.
 - Generated reports can not contain more than 200 images.
 - Reports with more than 150 images will increase the amount of time the **XLG3™ VideoProbe®** requires to generate. May take in excess of 5 minutes.
 - Reports are unable to open images not created using the **XLG3™ VideoProbe®**.

5. Generate Report: Press  **ENTER** to finalize the report.

Review Report

After the report has been generated, use the built-in tools on the **XLG3™ VideoProbe®** to review the report. Please note that the report is only able to be reviewed on a PC with Microsoft® Word, using the **USB Thumbdrive** containing the report.

1. Double-click the **Abiword** icon on the **XLG3™ VideoProbe®** desktop.
2. Click the **OPEN** button.
3. Browse to the folder containing the report and click the **OK** button.
4. Locate and select the <filename>.doc file that matches the opened report. Click the **OK** button.
5. To close: click the **X** in the upper right-hand corner of the window.
6. The report can now be exported to a PC using the **USB Thumbdrive**.
 - a. File > Save As > Browse for other folders > Select appropriate folder.



6 Managing Files & Communicating With Other Computers

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About the Thumbnail Screen

One way to manage files on the XLG3 system is to use the File Manager menu. When you use this menu, you select files from a thumbnail screen. Here is an example of a thumbnail screen showing an internal drive (DriveC) that contains the following items:

- a folder named “G3”
- two JPEG files
- two video files

The instructions on a thumbnail screen vary with the task: recalling, copying, deleting, etc.

To learn about an alternative way to manage files, see [“Using the Desktop”](#) on page 80.



🔊 = audio comments

🎥 = video

“M” at beginning of default file name = measurement image

Working With Removable Storage Devices

The XLG3 system is compatible with various removable storage devices: DVDs, PC cards, memory sticks, portable drives — any compatible USB-based or PCMCIA-based device.

All devices must be Windows formatted.


Whenever you record video to the PC card slot, special considerations apply. For details, see [“Select Drives”](#) on page 65.

To Insert a Storage Device

Insert the device into the appropriate drive.

The system automatically detects and names the device. The system tries to assign each device a name based on information on the device itself. If no information is available, the system uses the name “Generic Storage Device.”

To Eject a Storage Device Other than DVD

1. Press .
2. Select **File Manager > Eject Hardware > device**.
3. When you see a message confirming that it is now safe to remove the device, remove the device.



Caution Always use the Eject Hardware menu command before you remove any storage device from any drive other than a DVD. If you remove a device without first using this command, data corruption or loss may result. The drive or device may also become temporarily unavailable.

To Eject a DVD


Press the button to the left of the DVD drive. You do not need to use the Eject Hardware menu command for DVDs.

For more, see [“About DVDs”](#) on page 64.

Recalling a File

Recalling a file means opening a saved image or video.


To Recall a File

1. Press .
2. Select **File Manager > Recall > drive or device**.
3. Select a file. It opens.

To learn about what you can do with a recalled file, see these sections:

- [“Working With a Recalled Image”](#) on page 49
- [“Working With a Recalled Video”](#) on page 68.

Creating, Renaming, or Deleting Folders

1. Press .
2. Select **File Manager > Folder**.
3. Select and perform the desired task.
 - Create
 - Rename
 - Delete

Copying Files

The Copy menu command lets you copy videos, still images, and audio files from the internal drive to any removable storage device except a DVD. While files are being copied, all functions except the File Manager and Setup menus are available.

To learn how to copy files to a DVD, see [“Archiving \(Copying\) Files to a DVD”](#) on page 79.

To Copy Files


1. Insert a storage device.
2. Press .
3. Select **File Manager > Copy**.
4. Select and perform the desired task.

Item	Description
Selected To	Copy selected files to the storage device.
All To	Copy all files to the storage device.
Folders To	Copy selected folders to the storage device.

Deleting Files

You can delete files from any removable storage device except a DVD.

To Delete Files


1. Press .
2. Select **File Manager > Delete**.
3. Select and perform the desired task.

Item	Description
Selected	Delete selected files.
All	Delete all files from the selected drive.
Folder	Delete the selected folder.

Renaming a File

You do not use the File Manager menu to rename files.

To Rename an Image or Video File

1. Recall the desired file.
2. Press .
3. Select **Rename** or **Rename Image**.
4. Enter a new file name. The new name overwrites the old.


Archiving (Copying) Files to a DVD

The Archive menu command lets you copy videos, still images, and audio files from the internal drive or from a removable storage device to a DVD. While files are being archived, all functions except the File Manager and Setup menus are available.

Before archiving, read [“About DVDs”](#) on page 64.

To learn how to copy files to other storage devices, see [“Copying Files”](#) on page 77.

To Archive Files to a DVD

1. Insert a DVD.
2. Press .
3. Select **File Manager > Archive**.
4. Select and perform the desired task.

Item	Description
Selected From	Copy selected files from the selected location.
All From	Copy all files from the selected location.
Folders From	Copy selected folders from the selected location.

If you start archiving to a new DVD that has not been initialized manually, the system automatically initializes it before archiving. See [“Initializing DVDs”](#) on page 64.

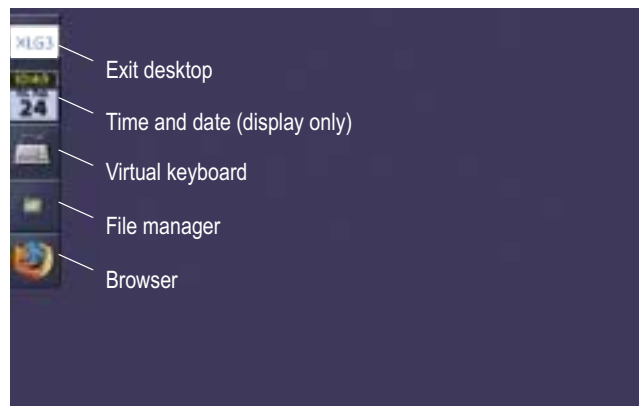
Using the Desktop

The virtual desktop is part of the optional network package. (See [“About the Network Package”](#) on page 5.)


With its graphical interface, the desktop does all of the following:

- Provides a familiar way to manage your files as an alternative to the File Manager menu.
- Gives you access to the Internet for viewing, downloading, or uploading web pages.
- Lets you use any outside e-mail service to send e-mail with files attached.
- Gives you access other applications, for example, a PDF reader.

The time and date icon on the desktop are for display only. To learn about changing the time and date, see [“Reviewing Settings for the System”](#) on page 42.

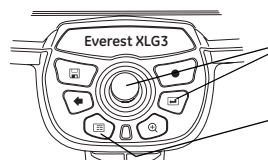


To Open the Desktop

1. While viewing a live image, press .
2. Select **Desktop**.

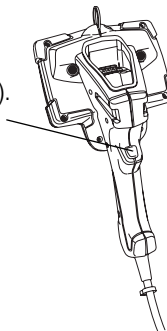
To Navigate the Desktop

If you do not have a mouse connected to your system, use the handset buttons to navigate the desktop.





Use these like a left mouse button (click, double-click).
Also use the joystick to drag items or scroll.

Use this like a right mouse button (brings up menus).




To Manage Files from the Desktop

1. Double-click  .
2. If you do not have a keyboard connected to your system, double-click  .
3. Perform the desired tasks — create, rename, move, or delete files or folders — as you would from any computer desktop.


Note When using the desktop, if you copy or delete still images, the system does not copy or delete associated audio (WAV) files. Normally, when you use the File Manager menu to copy and delete, WAV files are treated as part of the image file, but when you manage files using the desktop, you must copy or delete WAV files manually.

To Open the Browser

Double-click  .

A Firefox browser window opens for Internet access.

To Exit the Desktop

Press  .

- or -

Double-click the **XLG3** icon on the desktop.

Sharing Files or Live Video With a PC


PC file sharing and video streaming — viewing live video from a PC — are part of the optional network package. (See [“About the Network Package”](#) on page 5.)

If the XLG3 system is connected to a PC or network, you can send files back and forth between the system and other computers for viewing, remeasurement, or manipulation. You can also view live video on other computers. No drivers need to be installed.

Related Information

- [“To Establish Communication With a PC”](#) on page 83
- [“To View XLG3 Files at the PC”](#) on page 85
- [“To Manage Files From the PC”](#) on page 87
- [“To View Live Video From a PC \(Video Streaming\)”](#) on page 88

To Establish Communication With a PC

1. Connect the XLG3 system to the PC or network.
For details, see [“Connecting to a PC or Network”](#) on page 34.
2. At the XLG3 system, adjust communications settings as needed.
 - a. Press . Select **Setup Menu > Communications**.
 - b. Select one of these Remote File Access settings:
 - **Allow Read** — Select this if you only want to transfer files from the XLG3 system to the PC. Most people choose this option.
 - **Allow Read/Write** — Select this if you also want to transfer files from the PC to the XLG3 system.
 - c. Verify that all other XLG3 communications settings are set as needed.
For details, see [“Reviewing Settings for Communications”](#) on page 43.
 - d. Note the IP address. You will need it in Step 4.

IP Address Troubleshooting Tips

If you do not see an IP address in the XLG3 Communications menu and you are using Windows XP, verify your LAN settings as follows:

1. At the PC, open a browser window.
2. Select **Tools > Internet Options**.
3. Select the **Connections** tab.
4. Select **LAN Settings**. The Local Area Network (LAN) Settings screen appears, as shown here.
5. Verify that the **Automatically detect settings** box is checked, and the **Use a Proxy server for your LAN** box is unchecked.
6. Click **OK**.

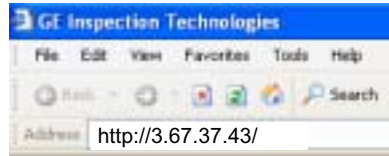


If you still do not see an IP address in the XLG3 Communications menu, refresh the screen by exiting and then reopening the Communications menu. (Press . Select **Setup Menu > Communications**.)

If you still do not see an IP address in the XLG3 Communications menu, reboot your PC with the Ethernet cable connected to the XLG3 system.

The PC needs to be on the same network as the XLG3 system to be able to establish communication.

3. At the PC, open a browser window.
4. In the URL address field, type **http://** then the XLG3 system's IP address, as shown in this example. Do not include **XLG3**. Press **Enter**.



The Remote Browsing screen appears, as shown in this example.



You have now established communication.

To View XLG3 Files at the PC

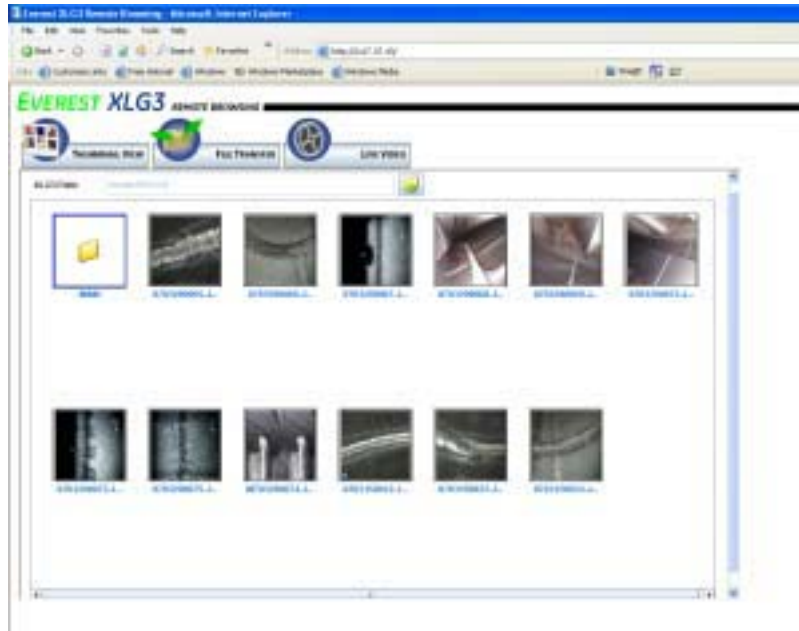
1. Establish communication with the PC.

For details, see “[To Establish Communication With a PC](#)” on page 83.

2. At the PC, select the **Thumbnail View** tab.

Thumbnail versions of files stored on the XLG3 system appear.

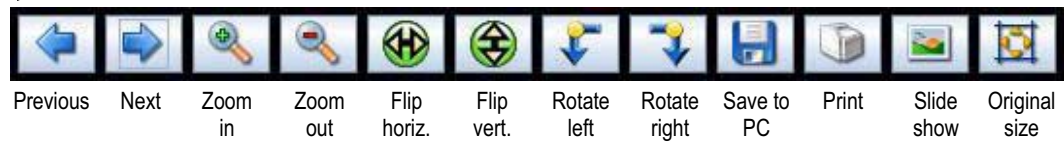
If no files appear, download the free software Java 1.5 or later at www.java.com.



3. Navigate to the desired location on the XLG3 internal drive or any external drive.

4. Double-click any thumbnail image. It becomes enlarged.

Manipulate it as desired using the buttons at the bottom of the screen.



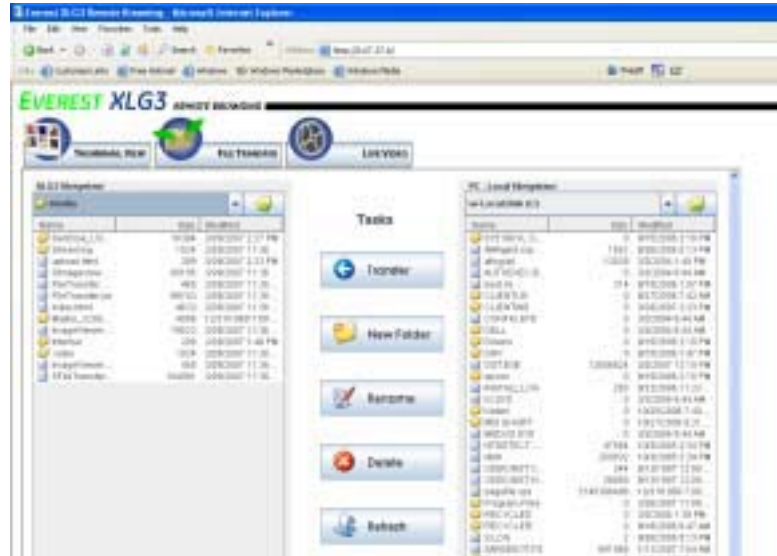
To Manage Files From the PC

1. Establish communication with the PC.

For details, see “[To Establish Communication With a PC](#)” on page 83. Remember that **Allow Read/Write** must be selected in the XLG3 Communications settings.

2. At the PC, select the File Transfer tab.

Files stored on the XLG3 appear on the left; files stored on the PC appear on the right. If no files appear, download the free software Java 1.5 or later at www.java.com.



3. Navigate to the desired locations on each side, and select the desired files or folders.
4. Select the desired task button.
 - If transferring files to the XLG3 system, before you select the Transfer button, open the XLG3 folder named Internal, or one of the subfolders inside Internal, so that you will be able to find the files easily later.
 - If deleting files from the XLG3 system, note that you cannot delete folders containing files. You must first delete all files in the folder.

To View Live Video From a PC (Video Streaming)

1. Establish communication with the PC.

For details, see [“To Establish Communication With a PC”](#) on page 83.

2. Verify that video streaming is turned on.

For details, see [“Reviewing Settings for Communications”](#) on page 43.

3. At the PC, select the **Live Video** tab.

If VLC Media Player is not installed on your PC, a prompt appears, including downloading instructions. Download and install this plug-in.

4. Select **Play**.

Live video appears on the PC screen in near real-time (up to a 10-second lag). Live audio is also transmitted.

5. Control your viewing by using the buttons to the right of the video.

Note When video streaming is on, video cannot be recorded to the DVD drive.



7 Measuring Features and Defects

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Shadow Measurements	100
Comparison Measurements	106
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About Measuring

Measurement capability is optional on the XLG3 system. If your system has this option, you can measure features or defects either before or after saving an image (if the image was saved in measurement mode). You can save up to five measurements per image.

The best LCD display setting for measuring is Unscaled. To learn about this setting, see [“Reviewing Settings for the System”](#) on page 42.

Measurement results are valid only for measurements taken in air. For measurements taken in liquid, contact GE Inspection Technologies.

GE Inspection Technologies cannot guarantee the accuracy of measurements calculated by the XLG3 system. Accuracy varies with the operator’s ability.

All measurement images saved using the XLG3 system can be remeasured on a PC using iView PC. For details, see [“Connecting to a PC or Network”](#) on page 34 (Step 4).

The XLG3 system can display measurement images that were captured on the Everest XL PRO™ VideoProbe system, including their previously captured measurements. However, you cannot remeasure these images on the XLG3 system.

About Measurement File Formats

You can save measurement images as JPEGs or bitmaps. You can view these files, including the measurement results, in most .BMP or .JPG viewing applications, such as Windows Paint. To learn how to change the file format, see [“Reviewing Settings for Image Format and Quality”](#) on page 38.

Types of Measurement


The XLG3 system supports three types of measurement: stereo, shadow, and comparison.

Related Information

-

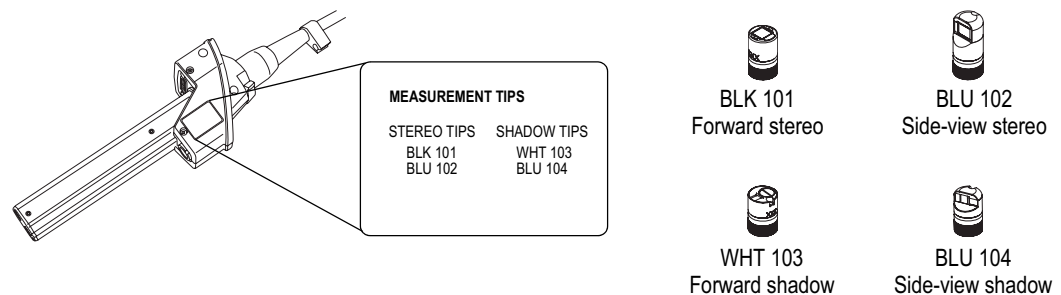
About the Measurement Tips

Unlike standard optical tips, ShadowProbe® and StereoProbe® measurement tips are factory-calibrated for use with specific probes and will not measure accurately with other probes. These tips are matched to probes by the serial numbers identified on each optical tip and each probe label. Calibration data is stored in memory in the probe.

To ensure measurement accuracy, check each tip's calibration every twelve months. To display the calibration data, press . Then select **Setup Menu > Measure > Stereo or Shadow > Cal Info**.

To ensure that no mechanical damage has degraded their accuracy, verify measurement tips each time you use them. See [“Verifying Measurement Tips”](#) on page 108.

To learn which tips are available for which probes, see [“Optical Tips”](#) on page 141.



About the Accuracy Index

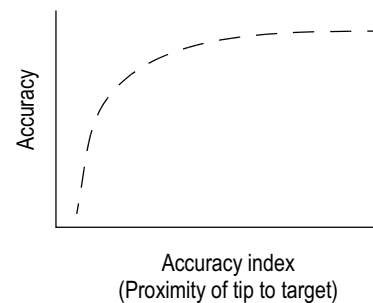
The accuracy index is a number that indicates the amount of magnification during shadow or stereo measurements. The higher the accuracy index, the greater the magnification, the more accurately you can place the measurement cursors, the more accurate your results.

When taking shadow or stereo measurements, you magnify the image not by zooming but by moving the optical tip as close as you can to the target.

To learn about the settings for the accuracy index — how to turn it on and off, and how to change the minimum value at which it flashes — see [“Reviewing Settings for Measurement”](#) on page 41.



The accuracy index can be displayed to indicate the amount of magnification you have achieved.



Stereo Measurements

Stereo measurements require the use of StereoProbe measurement tips, which capture stereoscopic images of a target — two pictures of the same target from two different angles. To measure the target, the XLG3 processor uses triangulation based on these two side-by-side images.

You can take stereo measurements on a frozen image or on a recalled image that was saved in measurement mode.

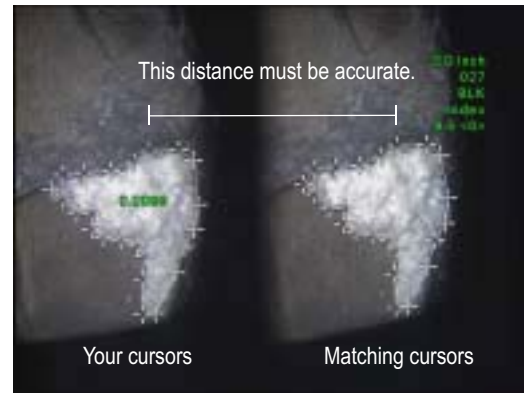
Related Information

Topic	Sections
Stereo measurement's advantages and disadvantages	"Types of Measurement" on page 90
Matching cursors, which make triangulation possible	"About the Matching Cursors" on page 93
How to perform stereo measurements	"To Position the Probe Tip for a Stereo Measurement Image" on page 94 "To Take a Stereo Measurement" on page 96 "Types of Stereo Measurement" on page 98

About the Matching Cursors

For each cursor you place on the left image during stereo measurement, the system places a matching cursor on the right image for use in triangulation.

You must place each left cursor on an image point (a pixel) that has sufficient surrounding detail to differentiate it from its neighboring pixels. If the neighboring pixels look the same as the point you choose — *especially the pixels to the point's left and right*, for example, pixels along a smooth horizontal line — the system cannot accurately place the matching cursor. When there is enough differentiating detail, the “match strength” is high (meaning that the generated match point clearly matches better than its neighboring pixels — the system’s confidence in the match is high). But if there is not enough detail, the match strength is low (meaning that the generated point and its neighboring pixels match almost equally well — the match may be correct, but the system’s confidence in the match is low).



For every matching cursor, the system calculates a match strength value between <0> (lowest confidence) and <5> (highest confidence). If too little detail is present, the system simply does not generate a matching cursor. Whenever possible, you want to achieve a match strength of at least <3>. If you can't, try capturing another image with less glare or more image details. (Adjust the tip orientation or brighten the image.)

Even when match strength is <5>, and especially when the match strength is lower, you need to verify that the matching cursor appears to be placed properly. A matching cursor that is off by just one pixel can have a significant impact on the measurement accuracy.

To Reposition a Matching Cursor

Note Matching cursors are most likely to be misplaced when the measurement area contains a repeating pattern. Generally, you get the best results by leaving the matching cursors exactly where the system places them.

1. If zoom windows are open, press \oplus to close them.
2. Move the matching cursor to the correct position, as described on the screen.

When you stop moving the cursor, the system optimizes the match position. (If you leave zoom windows on while moving the matching cursor, the system does not optimize the match position.)

Each manually corrected matching cursor is indicated by two things: a square around it, and the absence of a match strength number.

Taking Stereo Measurements

For maximum accuracy in any type of stereo measurement, you must begin by positioning the stereo tip carefully.

To Position the Probe Tip for a Stereo Measurement Image

Before freezing a stereo measurement image, position the probe tip to meet these criteria:

- **Visibility.** The item to be measured is fully visible on both sides of the screen.
- **Tip-to-target proximity.** The tip is as close as possible to the target while keeping it in focus.
- **Minimal glare.** Glare is minimized by adjusting the viewing angle and the image brightness in the areas where you will be placing cursors. Small glare speckles do not present a problem, but larger glare areas may appear in different positions on the two sides, causing false matches.
- **Vertical orientation.** If measuring distance between lines or across a circle, the image is oriented so that you can place cursors at left and right edges of the item to be measured — not at top, bottom or diagonal points. The system needs differentiated details to the left and right of each cursor to accurately place the matching cursors in horizontal relationship to the left-side cursors. For detailed explanation and illustration, see [“About the Matching Cursors”](#) on page 93.



Both images were captured for length measurement across the slot.

Bad Example

- Object is not fully visible on right side.
- Object is not well lit. (Optical tip needs to move closer to surface.)
- Object is not oriented to allow placement of cursors at left and right edges of circle or gap.



Good Example


- Object is fully visible on both sides.
- Object is well lit with minimal glare.
- Object is oriented to allow placement of cursors at left and right edges of circle or gap.

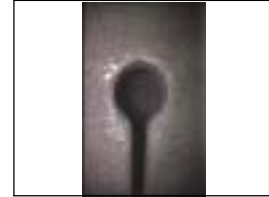
Note: The system cannot accurately match points *along* a smooth, straight line. To measure along a smooth, straight line, use shadow measurement. (If you must use stereo measurement, orient the image so that the line is vertical.)

About Single View

While you are positioning the stereo tip, you may want to turn on Single View, which temporarily eliminates the second image, making it easier to aim the camera.

To Turn On Single View



1. While viewing a live stereo image, press .
2. Select **Image > Single View > On**.



Single View

To Exit Single View

Do one of the following:

- To return to the live dual image, press .
- To freeze the image and proceed with measuring, press .

To Take a Stereo Measurement

1. Attach the stereo tip securely, and verify it.

See [“Verifying Measurement Tips”](#) on page 108.

2. Position the probe tip for maximum accuracy.


See [“To Position the Probe Tip for a Stereo Measurement Image”](#) on page 94.

3. Freeze the image.

4. Select the measurement type and tip.

Press . Select **Measure** > **Stereo** > *measurement type* > *tip*.

5. Place the cursors in the left half-screen, as described on the screen.

Measurement accuracy depends on all cursors being positioned accurately. For best accuracy in cursor placement, press  to activate the zoom window for a close-up view of the image around the active cursor.

To learn how to place cursors for specific measurement types, see [“Types of Stereo Measurement”](#) on page 98.

As you move each cursor, the matching cursor in the right half-screen moves accordingly.

6. Inspect each matching cursor as soon as it appears.

Generally, you get the best results by leaving the matching cursors exactly where the system places them. However, under certain circumstances, such as when a repeating pattern exists, you may need to help the system find the correct match. For details, see [“About the Matching Cursors”](#) on page 93.




7. (Optional) Reposition the left-side cursors and the measurement result. Reinspect the matching cursors.

8. (Optional) Verify your measurement accuracy.

Move each left-side cursor a few pixels. If the matching cursors move identically, and if the results change only a little, you have probably achieved accurate results. But if a matching cursor's movement is erratic, or if the results change significantly, your results are unreliable. Capture a fresh image, following the guidelines under [“To Position the Probe Tip for a Stereo Measurement Image”](#) on page 94.

Note This step is especially useful if you have to use a low accuracy index (less than 5) or low match strength (less than 3). For example, you might have to use a low accuracy index if you are measuring a large object or if you have limited access and cannot bring the tip close to the target. You might have to use low match strength if the surface has few details.

9. (Optional) Perform any of these tasks:

Task	Menu Item
Add measurements, up to five total.	Press  . Select Measure > Add .
Clear some or all measurements.	Press  . Select Measure > Clear measurement .
Select the correct tip in the software (if the selected tip is not the one that you are using).	Press  . Select Measure > Tip .


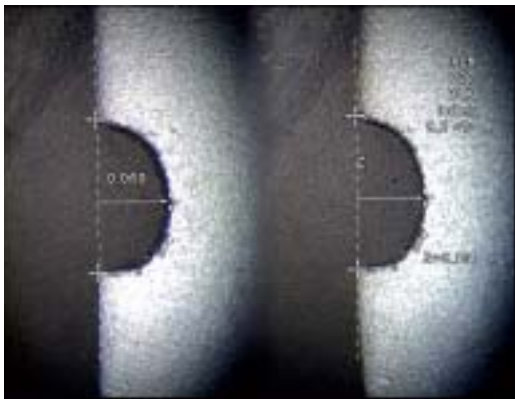
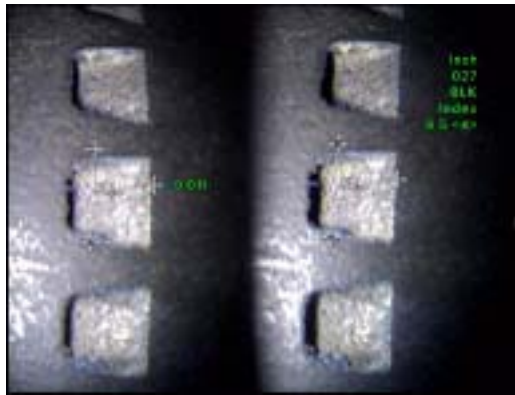
10. Save the image.





Press . For details, see [“Saving an Image”](#) on page 61.

Note Stereo images are saved without zoom windows, borders, and certain other screen graphics. This way, more of the image is visible if you recall it for remeasurement.

Types of Stereo Measurement

This table specifically addresses cursor placement for each type of stereo measurement. For the complete procedure, see [“To Take a Stereo Measurement”](#) on page 96.

Type	Example — “Matching Cursors” on Right Image	Description	Cursor Placement On Left Image
Length		A linear (point-to-point) measurement.	Place both cursors.
Point to Line		The perpendicular distance from a point to a line.	Place the first two cursors to define a reference line. Place the third cursor at the perpendicular distance you want to measure.
Depth		The perpendicular distance between a surface and a point above or below it. Used to evaluate changes due to wear, misalignment, and other causes. Negative measurements indicate that the point lies below the plane. Positive measurements indicate that it lies above.	Place the first three cursors to define a reference plane. Place the fourth cursor at the perpendicular distance you want to measure. Note: Depth measurements taken at a low accuracy index are particularly sensitive to the matching cursor's position. If the accuracy index is low, increase it by bringing the probe tip closer. If you cannot increase the accuracy index, place cursors so that they yield high match strengths, and verify your accuracy as described in Step 8 on page 96.

Type (cont.)	Example — “Matching Cursors” on Right Image (cont.)	Description (cont.)	Cursor Placement On Left Image (cont.)
Area		<p>The surface area contained within multiple cursors placed around a feature or defect.</p>	<p>Place three or more cursors (up to 24) around the edge of the area you want to measure.</p> <p>When finished, press  twice. The area closes.</p>
Multi-segment line		<p>The length of a nonlinear feature or defect.</p>	<p>Place two or more measurement cursors (up to 24) to create segments along the feature.</p> <p>When finished, press  twice. The line is finalized.</p>

Shadow Measurements

Shadow measurements require the use of ShadowProbe measurement tips, which project a shadow onto a target. To measure the target, the XLG3 processor uses triangulation based on the shadow's location. You can take shadow measurements on a frozen image or on a recalled image that was saved in measurement mode.

Related Information

Topic	Sections
Shadow measurement's advantages and disadvantages	"Types of Measurement" on page 90
How to perform shadow measurements	"To Position the Probe Tip for a Shadow Measurement Image" on page 101 "To Take a Shadow Measurement" on page 103 "Types of Shadow Measurement" on page 104

Taking Shadow Measurements

For maximum accuracy in any type of shadow measurement, you begin by positioning the shadow tip carefully.

To Position the Probe Tip for a Shadow Measurement Image

Before freezing a shadow measurement image, position the probe tip to meet these criteria:

- **Tip-to-target proximity.** The tip is as close to the surface as possible while still viewing the entire item to be measured. The shadow moves toward the left as the tip approaches. Measurements can be made even if the tip is so close that the image is somewhat out of focus, as long as the features are sharp enough to place the cursors accurately.

For depth measurements, in particular, the tip needs to be close enough to noticeably break the shadow so that the system can accurately differentiate between the raised and recessed surfaces.

- **Perpendicular surface.** There are two criteria here. (1) The shadow is straight up and down, indicating that the surface is vertically perpendicular to the probe view. (2) Visual cues, such as illumination and perspective, indicate that the surface is approximately perpendicular to the probe view horizontally as well.
- **Shadow's proximity to item.** The shadow is near, and on the same plane as, the item you want to measure.



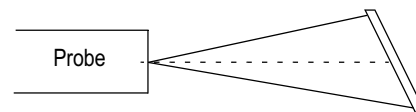
Both images were captured for length measurement across the slot.



Bad Example

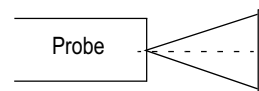
- Shadow is on right side of screen.
(Optical tip needs to move closer to surface.)
- Shadow is not quite vertical, and surface appears skew.
(Surface is neither vertically nor horizontally perpendicular to probe view.)

Note: Linear measurements can be taken on a skew surface, but only if you select the "skew" measurement type.



Good Example

- Shadow is further left.
(Optical tip is very close to surface.)
- Shadow is vertical, and surface does not appear skew.
(Surface is perpendicular to probe view.)
- Shadow is on same plane as item to be measured.





Both images were captured for depth measurement.



Bad Example



From this in-focus distance, there is little difference between the shadow positions on the raised and recessed surfaces, so you are unlikely to get an accurate depth measurement.

Good Example

With the tip closer to the surface, even though the image becomes blurry, the break in the shadow is more significant, so you are more likely to get an accurate depth measurement.






Note: For both depth and skew measurements, the points that you want to measure must fall in the horizontal center of the shadow.


To Take a Shadow Measurement

1. Attach the shadow tip securely, and verify it.
See [“Verifying Measurement Tips”](#) on page 108.
2. Position the probe tip for maximum accuracy.
See [“To Position the Probe Tip for a Shadow Measurement Image”](#) on page 101.
3. Freeze the image.
4. Select the measurement type and tip.
Press . Select **Measure** > **Shadow** > *measurement type* > *tip*.
5. If a vertical dashed line (called the *shadow line*) appears, center it over the shadow.
Measurement accuracy depends on centering this line accurately.
6. Place the cursors.
Measurement accuracy depends on all cursors being positioned accurately. For best accuracy in cursor placement, press  to activate the zoom window for a close-up view of the image around the active cursor.

To learn how to place cursors for specific measurement types, see [“Types of Shadow Measurement”](#) on page 104.



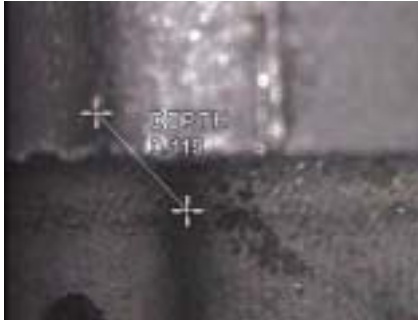
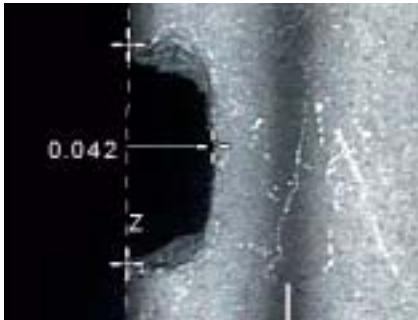
7. (Optional) Reposition the cursors and the measurement result.
8. (Optional) Perform any of these tasks:

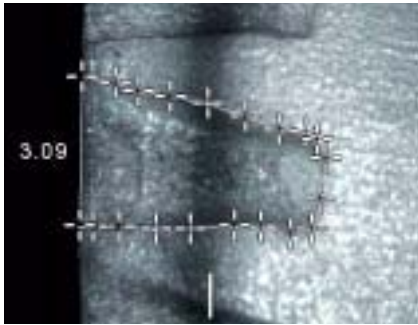




Task	Menu Item
Add measurements, up to five total.	Press  . Select Measure > Add .
Clear some or all measurements.	Press  . Select Measure > Clear measurement .
Select the correct tip in the software (if the selected tip is not the one that you are using).	Press  . Select Measure > Tip .
Adjust the shadow line's position.	Press  . Select Measure > Move Shadow Line . (Shortcut: Hold  .)

9. Save the image.
Press . For details, see [“Saving an Image”](#) on page 61.

Types of Shadow Measurement

This table specifically addresses cursor placement for each type of shadow measurement. For the complete procedure, see [“To Take a Shadow Measurement”](#) on page 103.

Type	Example	Description	Cursor Placement
Distance		A linear (point-to-point) measurement.	Place cursors on or near the shadow.
Skew		A linear (point-to-point) measurement on a surface that is not perpendicular to the probe view. Take a skew measurement only if you cannot obtain a vertical shadow.	Place cursors in the horizontal center of the shadow.
Depth		The perpendicular distance between a surface and a point above or below it. Used to evaluate changes due to wear, misalignment, and other causes. The shadow is further left on the surface that is closer to the probe tip.	Place cursors on the raised and recessed surfaces in the horizontal center of each shadow.
Point to line		The perpendicular distance from a point to a line.	Place the first two cursors to define a reference line. Place the third cursor at the perpendicular distance you want to measure.

Type (cont.)	Example (cont.)	Description (cont.)	Cursor Placement (cont.)
Area		<p>The surface area around a feature or defect.</p>	<p>Place three or more cursors (up to 24) around the edge of the area you want to measure.</p> <p>When finished, press  twice. The area closes.</p>
Multi-segment length		<p>The length of a nonlinear feature or defect.</p>	<p>Place two or more measurement cursors (up to 24) to create segments along the feature.</p> <p>When finished, press  twice. The line is finalized.</p>
Circle gauge		<p>A quick, “go – no go” method of determining whether defects fall within allowable limits.</p>	<p>Place circle on or near the shadow.</p>

Comparison Measurements

Comparison measurements rely on the known dimensions of an object that has been set in the field of view either by the manufacturer or by the probe. The XLG3 processor uses these known dimensions as a reference scale for measuring an unknown target.

You can take comparison measurements on a frozen image or on a recalled image that was saved in measurement mode.

Related Information

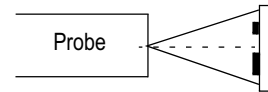
Topic	Sections
Comparison measurement's advantages and disadvantages	"Types of Measurement" on page 90
How to perform comparison measurements	"Taking Comparison Measurements" on page 107

Taking Comparison Measurements


1. Attach any standard forward-view or side-view tip to the probe.

2. Position the probe tip for maximum accuracy:

- The surface should appear perpendicular to the probe view.
- The target and known object should both be in the same view and plane.
- The tip should be as close as possible to the target.



3. If the object and reference are small on the screen, zoom in.

Press  until the known object and the target fill the screen as much as possible.

4. Freeze the image.

5. Select the measurement type.

Press . Select **Measure** > **Comparison** > *measurement type*.

6. Establish the reference distance.




Place the two reference cursors at the endpoints of a known distance. Then adjust the displayed number until it matches that distance.

7. Place the cursors for the feature or defect you want to measure.

To learn how to place cursors for a particular type of comparison measurement, follow the same instructions as for [“Types of Shadow Measurement”](#) on page 104.

8. (Optional) Reposition the cursors and measurement result.

9. (Optional) Perform any of these tasks:

Task	Menu Item
Add measurements, up to five total.	Press  . Select Measure > Add .
Clear some or all measurements.	Press  . Select Measure > Clear measurement .
Establish a new reference dimension.	Press  . Select Measure > New Ref Dim .

10. Save the image.

Press . For details, see [“Saving an Image”](#) on page 61.

Verifying Measurement Tips

Verify measurement tips each time you use them to ensure that no mechanical damage has degraded their accuracy.

Every XLG3 system equipped with measurement capability is shipped with a measurement verification block. This tool lets you verify the accuracy of measurement tips. It contains optical measurement targets whose accuracy is traceable to the United States National Institute of Standards and Technology (NIST) measurement standards.

These are the part numbers for the verification blocks used with the XLG3 system:

VER2400B For 3.9 mm systems

XLG3TM61VER For 6.1 mm systems

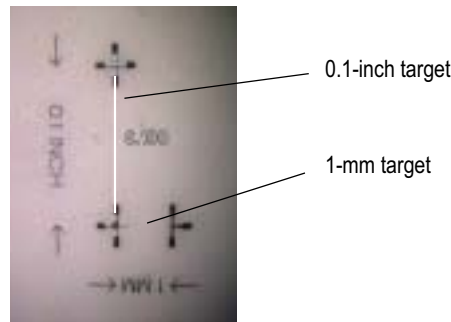
Each measurement verification block comes with a calibration schedule and a certificate of calibration (C of C), which notes the calibration date and due date.

Each block has four chambers: side-view shadow, forward-view shadow, side-view stereo, and forward-view stereo. Each chamber contains two calibrated test targets: 0.1 inch and 1 mm.

Measurement verification block



Test targets inside block



To Verify a ShadowProbe or StereoProbe Measurement Tip


1. Attach the shadow or stereo tip securely.
2. Insert the tip into the appropriate test chamber.
3. Measure the test target that matches the units you use: inches or mm.
4. Evaluate your results.


An experienced user can achieve a measurement of 0.100 ± 0.005 inches (1.00 ± 0.05 mm). If your measurement does not fall within these limits, try the suggestions under [“Troubleshooting Inaccurate Measurements”](#) on page 109.

Troubleshooting Inaccurate Measurements

Help: I'm Getting Inaccurate Stereo or Shadow Measurements

Move the probe tip as close as possible to the target, maximizing magnification.

Verify that the tip that is attached to the probe matches the tip information that is selected in the software. Press . Select **Measure** > **Tip**.

Verify that you have selected the correct type of measurement. Press . Select **Measure** > **Shadow** or **Stereo** > *measurement type*.

Verify that the optical tip is threaded on to the probe head securely.

Measure the target contained in the verification block to ensure that no tip damage has occurred. See [“Verifying Measurement Tips”](#) on page 108.

Help: I'm Getting Inaccurate Stereo Measurements

Avoid placing cursors in areas of significant glare. If necessary, adjust the brightness or reposition the probe tip to enhance details and reduce glare.

Verify that the object to be measured is near the center of the screen.

Verify that the matching cursor is correct within 1 pixel. If you cannot clearly see where the match point should be, select a different point, or capture the image from a different angle that better reveals details to allow better matching.

Activate the zoom window to most accurately place the measurement cursors.

Try shadow measurement instead if there is little detail in the measurement area, or if you need to measure along smooth, straight lines.

Review guidelines under [“To Position the Probe Tip for a Stereo Measurement Image”](#) on page 94.

Help: I'm Getting Inaccurate Shadow Measurements

Verify that the surface is perpendicular to the probe view for all but skew measurements.

Verify that the shadow is properly oriented, the vertical dashed line (if any) is centered, and the cursors are properly placed.

Review guidelines under [“To Position the Probe Tip for a Shadow Measurement Image”](#) on page 101.

enance

- id Cleaning the System
- Lamp
- d Replacing the Fuses
- ne Battery
- Internal Memory Card

eaning the Syst†

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distorter† the optical tip is securely
; most† . For best image quality, clean
) ar

ve repair, return the system to
ctic or conditions can prevent much more
repr

↑ t. uk the handset or the probe power plug.

pect a al Tip

Check th† damage or contamination.

.. Clean all† the optical tip. Use glass cleaner or 70% alcohol-to-water solution
and a po† cotton swab.

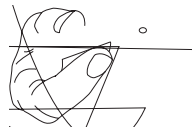


To Inspect and Clean a Probe

1. Check the probe for damage or contamination. Look for excessive wear in the bending neck, loose strands of the braided weave, or separation of the bonding joints.



2. 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.



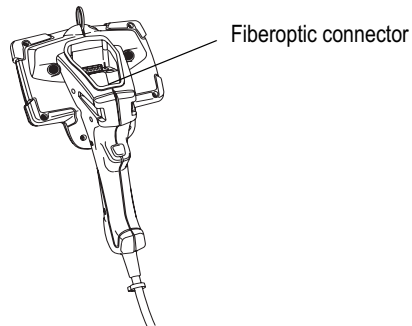
3. Clean the rest of the probe, including insertion tube and fiberoptic connector. Use a soft cloth dampened with glass cleaner or 70% alcohol-to-water solution.

To Inspect and Clean a Dust Filter

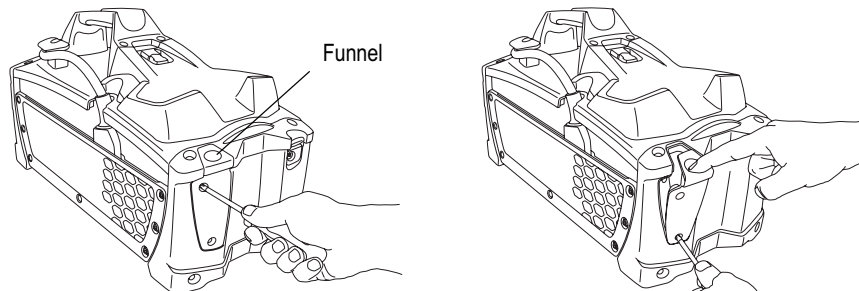
1. Check to see if the dust filter has become clogged, reducing airflow and preventing proper cooling.
2. If necessary, remove the filter, rinse it with water, and let it dry completely. Or replace it with a new filter, part number XLG3AFILTER.

To Inspect and Clean the Handset

1. Disconnect the power cord from the power source.
2. Check for damage or contamination, including any bent pins on the electrical connector.
3. Clean all parts of the handset, including the fiberoptic connector. Use a soft cloth dampened with glass cleaner or 70% alcohol-to-water solution.

**To Clean the Insertion Tube Storage Reel**

1. Disconnect the AC power cord from the power source.
2. Remove the insertion tube from the funnel.
3. Loosen the two screws, and remove the funnel.



4. Wipe inside the funnel and inside the reel. Use a soft cloth dampened with glass cleaner or 70% alcohol-to-water solution.
5. Replace the access panel.

Replacing the Lamp

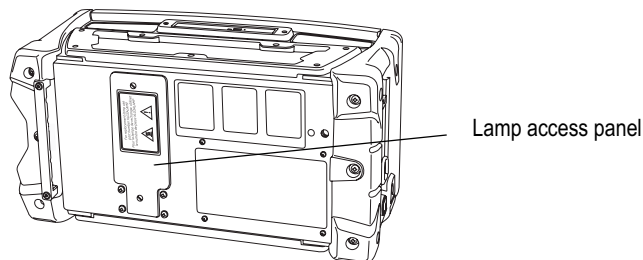
To Determine Whether to Replace the Lamp

If the lamp does not come on when you turn the power switch on, verify all of the following things before replacing the lamp.

- The probe is properly latched in the handset.
- The lamp was correctly installed.
- The system was not turned on too quickly after being turned off. (Leave the system off for at least 15 seconds so that it can complete its shutdown sequence. Then turn it back on.)
- The system is not too hot. (The lamp shuts down in over-temperature conditions.)
- The power switch's green LED lights up when the switch is on. If not, see [“Power Problems”](#) on page 124.

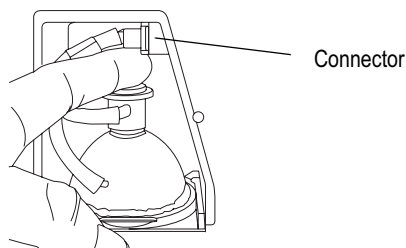
To Remove the Lamp

1. Disconnect all sources of power.
 - If using AC power, disconnect the power cord from the power source.
 - If a battery is installed, disconnect and remove it. See [“To Remove the Battery”](#) on page 118.
2. Unscrew and remove the lamp access panel.



WARNING LAMP MAY BE HOT. Could cause burns. If the lamp has been on, wait 10 minutes for it to cool.

3. Disconnect the connector above the lamp. Gently remove the lamp.



Point the

b. Select

- **Ex**
Co

Default

... the original factory setting.

Checking and Replacing the Fuses

If the system power switch is on but the system is not powering up, try the troubleshooting tips under “[Power Problems](#)” on page 124. If necessary, check or replace fuses. Use the same fuse type and rating. For fuse values, see “[Fuses](#)” on page 127.



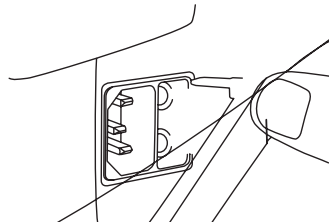
Caution If, after replacing a fuse, the new fuse blows, contact GE Inspection Technologies.

To Check or Replace the AC Fuses



WARNING Before checking or replacing the AC fuses, always turn power switch off, and unplug AC power cord from the base unit. Exposure to live AC power could result in serious injury or death.

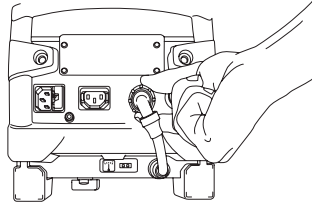
1. Turn off the power switch. Unplug the AC power cord from the base unit.
2. Verify that the AC power cord and power source are both working properly.
 - If not, fix the problem.
 - If so, go to Step 3.
3. Squeeze the release tab on the AC fuse block, and remove the fuse block.



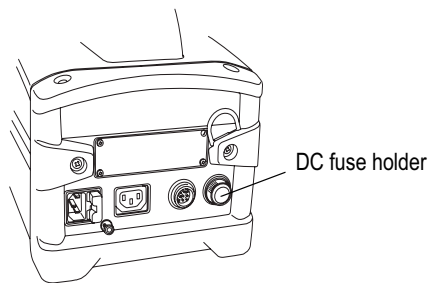
4. Remove the fuses by pulling both out firmly.
5. Inspect each fuse. If the glass appears cloudy, the fuse is blown. Replace any blown fuse.
6. Reinsert the fuse block.

To Check or Replace the Battery (DC) Fuse

1. Turn off the power switch.
2. Unplug the DC power connector.



3. Turn the DC fuse holder counterclockwise.



4. Remove the fuse, and check it with an ohmmeter.
 - If < 1.0 ohm, the fuse is good.
 - If > 1.0 ohm, replace with a new fuse.

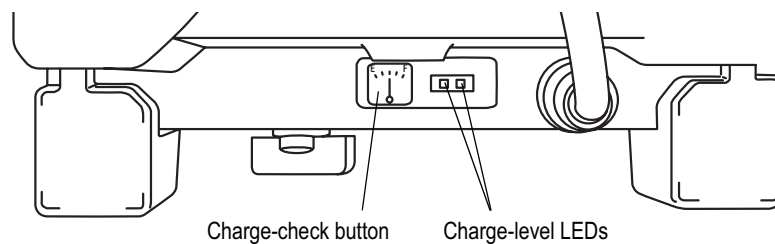
Maintaining the Battery

To Check the Battery's Charge Level

While the battery is in use, press the charge-check button. The green and red LEDs light up according to the battery's charge level, as shown here.

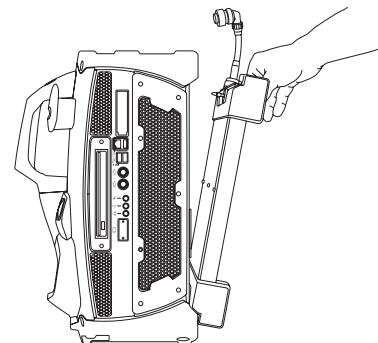
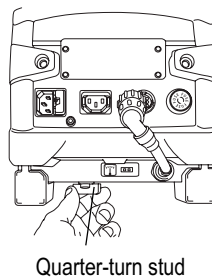
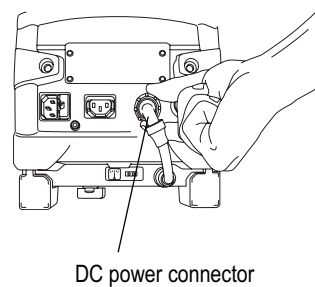
LED Status	Battery Charge Level
Green on	> 80%
Red on	< 80%
Red flashing	Very low
Both off	No charge

These two LEDs do not light up until you press the button.



To Remove the Battery

1. Turn off the power switch.
2. Unplug the DC power connector.
3. Turn the quarter-turn stud counterclockwise.
4. Remove the battery.



To Charge the Battery

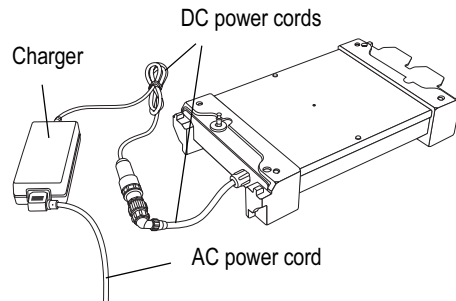
1. Connect to power in one of these ways:

- **Battery installed**

If the battery is installed in the base unit, plug the base unit into AC power. The battery charges whether the system is on or off.

- **Battery removed**

If the battery is removed from the base unit, connect the charger's DC power cord to the battery's DC power cord. Then plug one end of the AC power cord into the charger and the other end into the AC outlet.



2. Wait for the battery to charge.

The battery's green LED flashes for a few seconds. Then it lights up solid and stays lit until the charge is complete. When the charge is complete, the green LED shuts off.

A fully discharged one-hour battery takes about four hours to charge.

A fully discharged two-hour battery takes about eight hours to charge.

If the red LED lights up during this process, contact GE Inspection Technologies.

Replacing the Internal Memory Card

The internal memory card contains the operating system software as well as your image and video files. You might want to replace the memory card, for example, to increase storage capacity.

Only qualified electrical technicians should replace this card. This card is not user serviceable.

To Replace the Internal Memory Card

1. Turn off all sources of power.

Turn off the power switch. Unplug AC power cord from power source. If a battery is installed, unplug the DC power connector.

2. Unscrew and remove the access panel.

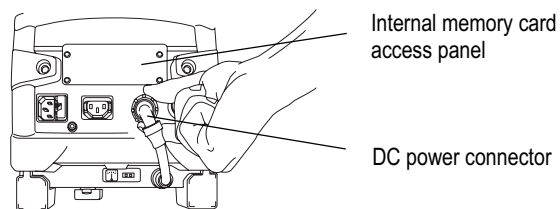
3. Eject the memory card.

Use a pen to push the button to the left of the drive.

4. Slide the new card into the drive. Push in gently to seat the card.

5. Reinstall the access panel.

6. Turn the system back on. Confirm that it starts correctly.



9 Troubleshooting

Image Problems	123
Probe Problems	124
Power Problems	124
Lamp Problems	124
Software Problems	125

For measurement problems, see [“Troubleshooting Inaccurate Measurements”](#) on page 109.

Image Problems

Condition	Causes	Actions
Images are distorted or blurred within normal range.	<ul style="list-style-type: none"> Optical tip is not threaded onto the camera head securely. The optical surfaces are dirty. 	<ul style="list-style-type: none"> Reinstall the optical tip. See “To Attach an Optical Tip” on page 31. Clean the optical tip and the camera head. See “To Inspect and Clean an Optical Tip” on page 111 and “To Inspect and Clean a Probe” on page 112.
Image quality is otherwise poor.	Various	<ul style="list-style-type: none"> Verify that the QuickChange probe is properly seated and latched. See “To Install a Probe” on page 30. Clean the optical tip and camera head. See “To Inspect and Clean an Optical Tip” on page 111 and “To Inspect and Clean a Probe” on page 112. If the problem occurs in DC operation, check battery’s charge and its compliance with listed specifications. For an illustration of the battery charge indicators, see “Maintaining the Battery” on page 118. Verify that the lamp has been installed properly. See “To Install a Lamp” on page 115.
No image appears in the display. (Green LED on the power switch is lit.)	Various	<ul style="list-style-type: none"> Verify that the probe is properly seated and latched. See “To Install a Probe” on page 30. Point the probe tip toward a bright light and see if image appears. If image appears, the problem is associated with lamp operation. If still no image, contact GE Inspection Technologies. If an external monitor is available, determine whether an image appears on it. Connect the monitor’s VIDEO IN (or S-VIDEO IN) to the base unit’s VIDEO OUT (or S-VIDEO OUT) connector. Verify the image.
Frozen image “jitters.”	Probe tip was moving when image was captured.	Unfreeze then refreeze the image, keeping probe tip steady.

Probe Problems

Condition	Causes	Actions
Reduced articulation in the bending neck.	Various	<ul style="list-style-type: none"> Whenever using the system, minimize bends throughout the entire length of the insertion tube, including the end nearest to the handset. Unnecessary bending can reduce articulation. Redistribute the lubricant inside the insertion tube as follows. Straighten the insertion tube to its full length, with Person A holding it near where it joins the handset (to stabilize the probe), and Person B holding it just before the bending neck (to prevent damaging the bending neck). Have Person B shake the entire tube. CAUTION: Do not pull on the probe tip or the bending neck while shaking the tube. The mechanical cables could break.
Bending neck is not articulating.	System is in a mode that disables articulation: Steer-and-Stay, freeze frame, menu, or desktop.	<ul style="list-style-type: none"> Exit any mode the system may be in. Turn power switch off. Leave the system off for at least 15 seconds so that it can complete its shutdown sequence. Then turn it back on.
Insertion tube does not freely withdraw from the storage reel.	Tube is obstructed.	Remove the funnel. Clear any obstruction or binding. For an illustration of removing the funnel, see "To Clean the Insertion Tube Storage Reel" on page 113.

Power Problems

Condition	Causes	Actions
When plugged into AC power, system won't turn on. (Power switch is on, but its green LED is not lit.)	<ul style="list-style-type: none"> Power interruption. Faulty AC power connection. Blown AC fuses. No AC power. 	<ul style="list-style-type: none"> Leave the system off for at least 15 seconds so that it can complete its shutdown sequence. Then turn it back on. Check the power cable connections. Check the AC power source. Check the AC fuses. See "To Check or Replace the AC Fuses" on page 116.
When unplugged from AC power, system won't turn on. (Power switch is on, but its green LED is not lit.)	<ul style="list-style-type: none"> Battery disconnected or incorrectly connected. Battery low, not charging, depleted, or bad. Blown battery fuse. 	<ul style="list-style-type: none"> Leave the system off for at least 15 seconds so that it can complete its shutdown sequence. Then turn it back on. Check battery's connections. See "To Remove the Battery" and "To Install a Battery" on page 119. Check battery's charge level. See "To Check the Battery's Charge Level" on page 118. Check the battery's compliance to listed specifications. Recharge or replace the battery. See "Maintaining the Battery" on page 118. Replace battery fuse. See "To Check or Replace the Battery (DC) Fuse" on page 117.

Lamp Problems

Condition	Causes	Actions
Lamp does not come on when you turn on power switch. (Green LED on the power switch is lit.)	Various	See "To Determine Whether to Replace the Lamp" on page 114.

Software Problems

Condition	Causes	Actions
Time, date, or other settings are lost when system is turned off.	Internal battery needs replacing. (Normal life is five to seven years.)	Return system to GE Inspection Technologies to have internal battery replaced.

A Specifications

Feature	Specification
Power	
AC	100 – 240 V, 50 – 60 Hz; 115 V, 400 Hz
DC (optional battery)	11 – 16 V
Maximum consumption	300 W
Nominal consumption	150 W (when not charging battery or using accessories)
Battery operation	Up to one hour (small battery) or two hours (large battery)
AC output	IEC-type F connector. The voltage and frequency of the power available at the AC output is the same as the voltage and frequency applied to the inlet. Maximum output is 100 W.
Arc lamp	75-watts, high-intensity discharge (HID)
Fuses	
AC	Type GDB, 6.3 A, 250 V GE Inspection Technologies part number 814104
DC (optional battery)	Type KLM-20, 20 A, 600 VDC GE Inspection Technologies part number 814080-1
Operating environment	
System operating temperature	-4° to 115° F (-20° to 46° C) LCD requires warm-up period below 32° F (0° C).
Tip operating temperature	-13° to 176° F (-25° to 80° C) Reduced articulation below 32° F (0° C).
Storage temperature	-13° to 140° F (-25° to 60° C)
Relative humidity	95% maximum, noncondensing

B Agency Certifications

European Equipment Classification

Group 1, Class A

The **CE** mark on this product indicates it has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive. The XLG3 system is in conformance with the following standards: EN61010-1, EN61326, EN55011.

Declarations of Conformity are held by GE Inspection Technologies GmbH:

GE Inspection Technologies GmbH
Product Service Center
Lotzenäcker 4
72739 Hechingen Germany
Tel: +49(0) 74719882 0
Fax: +49(0) 74719882 16

Safety Mark

The XLG3 system is in compliance with the following standards: UL61010-1 and CSA-C22.2 No. 61010-1.

Intrinsic Safety

The XLG3 system is not rated for intrinsically safe operation.

FCC Compliance

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Class A Compliance Statement

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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Caution: Any changes or modifications made to this device that are not expressly approved by GE Inspection Technologies may void the user's authority to operate the equipment.

To maintain compliance with FCC rules and regulations, cables connected to this device must be *shielded* cables, in which the cable shield wire(s) have been grounded (tied) to the connector shell.

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.

C Chemical Compatibility

Chemical compatibility refers to the probe's ability to come into contact with various liquid substances and not be damaged. There are far too many different liquids in the industrial environment for GE Inspection Technologies to test each one, so customers must determine for themselves whether the probe is compatible with their specific chemicals.

However, GE Inspection Technologies has tested the probe to several of the more common substances and reports the results in the hope that it might be of assistance.

Whatever the liquid, duration of exposure should be minimized and the probe cleaned after each use before storage.



WARNING POSSIBLE EXPLOSION HAZARD. Do not use this system in explosive environments.

These substances have no affect on the probe:

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

In general, if a liquid is relatively clear and safe for your hand, it is probably safe for the probe. If it is not safe for your hand, it is probably not safe for the probe.

D

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, where used, servo motors in the articulation drive system are warranted for the life of this VideoProbe product.

GE Inspection Technologies's 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 not cover lamps, 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.

E Menu Trees

Menu	How to Access
Main Menu: Live, page 135 Freeze Frame, page 136 Split Screen, page 136 Recalled Image, page 137 Recalled Video, page 137	Press  . The menu that appears depends on the type of image displayed.
Shared Menu: File Manager, page 138 Setup, page 138 Video Record, page 139 Video Recording Options, page 139 Save, page 140	Press  . Then select the desired menu.

Live Menu

Live image is displayed.




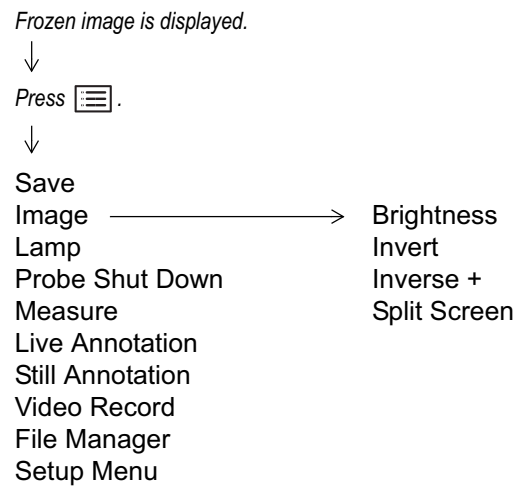
Press .

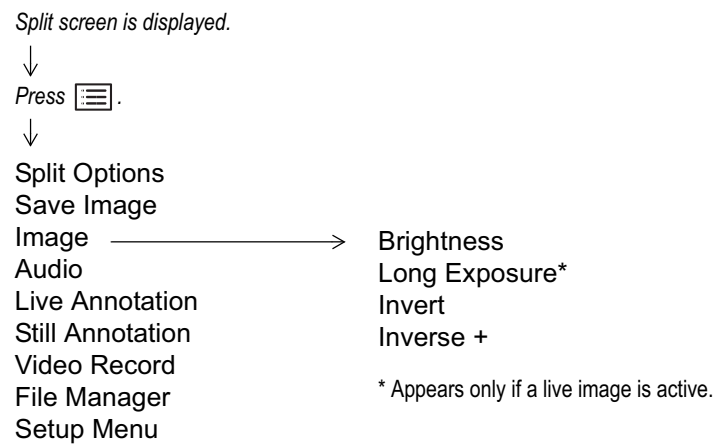


Image	→	Brightness
Menu Directed Inspection		Adaptive Noise Reduction
Lamp		Distortion Correction
Probe Shut Down		Long Exposure
Live Annotation		Invert
Video Record		Inverse +
Desktop		Single View
Flashlight		Split Screen
File Manager		
Setup Menu		

Freeze Frame Menu




Split Screen Menu



Recalled Image Menu

Recalled image is displayed.



Press .



Save Image

Image → Brightness

Rename Image Invert

Live Annotation Inverse +

Still Annotation Split Screen

Measure

Audio

Video Record

File Manager

Setup Menu

Recalled Video Menu

Recalled video is playing.



Press . Playback pauses.



Play

Rename


Save Still Image

File Manager

File Manager Menu

Any type of image is displayed.



Press . Select **File Manager**. Then select **File Manager** again.




Recall
Copy
Delete
Folder
Archive
Eject Hardware

Setup Menu

Any type of image is displayed.



Press . Select **Setup**.



Still Save		
Save Format		
JPEG Quality		
Graphics		
Text Color		
Logo		
Measure		
System	→	System Info
Temp Sensor		Language
Battery		Time/Date
White Balance		Steering
Audio		Distortion Values - Load
Communications	→	Menu Directed Inspection
		MDI
		Update Software
		Feature Update
		Video Output Format
		LCD Display
		Unit Name
		IP Address
		Remote File Access
		Remote Handset Control
		Relink Now
		Wireless Configuration
		Video Streaming

Video Record Menu

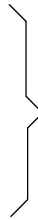
Any type of image is displayed.



Press . Select **Video Record**.



Start Recording
Resume Recording
Stop
Pause
DVD Initialize
Recording Options



Only the items that apply to your task will appear.

Video Recording Options Menu

Any type of image is displayed.



Press  quickly.

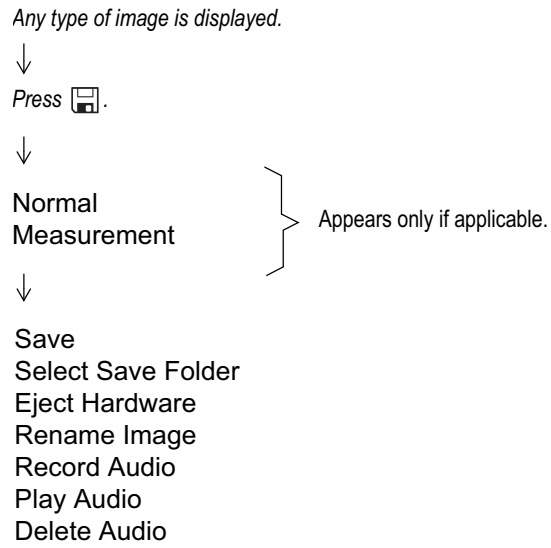
- or -

Press . Select **Video Record > Recording Options**.



Start Recording
Cancel
MPEG Quality
Mic
Select Drives
Select Save Folder
Name Video

Save Menu



F

Tip
Sta



.480SG

XLG3T6150FF

XLG3T6150FG

XLG3T61120FG

XLG3T6180FN

XLG3T6190FF

50

12 – 80 mm
0.5 – 3.2 in.

XLG3T6150FB

White

50

45 mm – infinity
1.77 in. – infinity

XLG3T6150SF

Green

50

9 – 160 mm
0.35 – 6.30 in.

XLG3T6150SG

Blue

120^b

4 – 100 mm
0.16 – 3.94 in.

XLG3T61120SG

Side

Red





80

1 – 20 mm
0.04 – 0.79 in.

XLG3T6180SN

- a. F
- b. L

and diagonally.
Correction is available for 120° tips. For details, see [“Correcting Wide-Angle Distortion”](#) on page 54.

Tip	Diameter (mm)	View (DOV)	Color	Field of View (FOV) ^a	Depth of Field (DOF)	Part Number
Standard Optical Tips (continued)						
	8.4	Forward	None	40	250 mm – infinity 9.84 in. – infinity	XLG3T8440FF ^b
	8.4	Forward	Gold	20	500 mm – infinity 19.69 in. – infinity	XLG3T8420FF
	8.4	Forward	Yellow	80	25 – 500 mm 0.98 – 19.69 in.	XLG3T8480FG
	8.4	Forward	Black	120 ^c	5 – 200 mm 0.20 – 7.87 in.	XLG3T84120FN
	8.4	Side	Brown	40	250 mm – infinity 9.84 in. – infinity	XLG3T8440SF ^c
	8.4	Side	Green	80	25 – 500 mm 0.98 – 19.69 in.	XLG3T8480SG
	8.4	Side	Blue	120 ^c	5 – 200 mm 0.16 – 7.87 in.	XLG3T84120SN
ShadowProbe Measurement Optical Tips						
	6.1	Forward	White	50	12 – 30 mm 0.47 – 1.18 in.	XLG3TM6150FG
	6.1	Side	Blue	50	7 – 24 mm 0.28 – 0.94 in.	XLG3TM6150SG
StereoProbe Measurement Optical Tips						
	3.9	Forward	Black	50/50	5 – 45 mm 0.20 – 1.77 in.	PXTM45050FG
	3.9	Side	Blue	50/50	4 – 45 mm 0.16 – 1.77 in.	PXTM45050SG
	6.1	Forward	Black	60/60	4 – 80 mm 0.16 – 3.15 in.	XLG3TM616060FG
	6.1	Side	Blue	50/50	2 – 50 mm 0.08 – 1.97 in.	XLG3TM615050SG
	8.4	Forward	Black	60/60	4 – 50 mm 0.16 – 1.97 in.	XLG3TM846060FG
	8.4	Side	Blue	60/60	4 – 50 mm 0.16 – 1.97 in.	XLG3TM846060SG

a. FOV is specified diagonally.

b. Indicates tips with maximum brightness

c. Distortion correction is available for 120° tips. For details, see ["Correcting Wide-Angle Distortion"](#) on page 54.

G Environmental Compliance



The equipment that you bought 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 our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems. Those systems will reuse or recycle most of the materials of your end-life equipment in a sound way.

The cross-out wheeled bin symbol invites you to use those systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

Visit www.ge.com/inspectiontechnologies for take-back instructions and more information about this initiative.

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