

Excelis HDMI

QUICK START GUIDE & Stand-Alone Operation



UNITRON

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Congratulations on the purchase of your new *Excelis HDMI* microscopy camera! This guide will help you get up and running fast so you may begin using your camera right away.

What's in the Box — AU-300 & 600

- *Excelis* HD or HD LITE Camera
- HDMI Cable
- USB 2.0 Cable (USB to USB)
- 12v Power Adapter
- SD Card (8GB with AU-600; 4GB with AU-300)
[accepts Class 10 SD cards, 32GB maximum]
- USB 2.0 Mouse
- USB flash drive containing:
 - Installation Instructions
 - *CaptaVision+* Software
 - Manual for *CaptaVision+* Software
 - *Excelis* HD Quick Start Guide

Excelis HD LITE Camera
AU-300 Series — gray



Excelis HD Camera
AU-600 Series—black



SD Card



USB Flash Drive



USB 2.0 Mouse



USB 2.0 Cable



HDMI Cable



Power Adapter



Also Included With AU-300-HDS & AU-600-HDS

- 11.6" HD Display
- Mounting Hardware
- HDMI Cable
- Y Power Splitter
- Installation Instructions (*not pictured*)

Using *Excelis HDMI* with a Monitor ONLY (Installation for Stand-Alone Operation)

The Excelis HDMI's on-board software allows the camera to be used without a PC. Just connect a compatible HD monitor (HDMI input) for stand-alone camera operation.

INSTALLATION

- 1) **INSTALL THE CAMERA:** Install the c-mount adapter onto your *Excelis HDMI* camera, then mount the camera onto your microscope's photo port.
- 2) **INSERT SD CARD:** the SD card was installed at the factory. However, make sure your SD card is inserted fully in the top of the camera – the camera will not save images or video without the SD card inserted and engaged.
- 3) **CONNECT MOUSE:** connect the mouse by plugging it into the USB port on the top of the camera.
- 4) **CONNECT HDMI CABLE:** connect one end of the HDMI cable by plugging it into the HDMI port on the top of the camera and the other end into the HDMI port on your monitor. Do not connect the other end of the HDMI cable to the HDMI port on a PC or Mac.
- 5) **CONNECT POWER CORD:** plug the one end of the power cord into the 12V DC port on the top of the camera and the other into a 120V AC outlet.
- 6) **SET YOUR MONITOR SIGNAL TO HDMI:** be sure to set your monitor's input signal to HDMI to enable it to see your camera.
- 7) **POWER ON THE CAMERA:** (Before turning on your camera, be sure your microscope is turned on and light is going to your photo port) - press the ON/OFF (power) button on the top of the camera – a blue light on the top will come on indicating the camera is ready. (The red light indicates stand-by mode.)



Congratulations on the purchase of your new *Excelis HDMI* microscopy camera! This guide will help you get up and running fast so you may begin using your camera right away.

What's in the Box — 4K

- Quick Start Connection Guide
- *Excelis* 4K Camera
- HDMI Cable
- USB 3.0 Cable (USB to USB)
- 12V Power Adapter
- USB 3.0 Mouse
- USB flash drive containing:
 - Installation Instructions
 - *CaptaVision+* Software
 - Manual for *CaptaVision+* Software
 - *Excelis* HD Quick Start Guide



Using *Excelis 4K* with a Monitor ONLY (Installation for Stand-Alone Operation)

The Excelis HDMI's on-board software allows the camera to be used without a PC. Just connect a compatible HD monitor (HDMI input) for stand-alone camera operation.

INSTALLATION

- 1) INSTALL THE CAMERA:** Install the c-mount adapter onto your *Excelis HDMI* camera, then mount the camera onto your microscope's photo port.
- 2) INSERT A USB DRIVE:** the USB flash drive that came with your 4K camera contains the CaptaVision+ software, manual and the Quick Start Guide. When using in stand-alone mode (without a PC), it is recommended to use a different USB flash drive to capture images as the 4K camera will not save images or video without a USB flash drive inserted. Insert the USB flash drive for saving images into the USB 3.0 port on the camera – do not insert it into the port marked "Mouse".
- 3) CONNECT MOUSE:** connect the mouse by plugging it into the MOUSE port of the camera.
- 4) CONNECT HDMI CABLE:** connect one end of the HDMI cable by plugging it into the HDMI port on the camera and the other end into the HDMI port on your monitor. Do not connect the other end of the HDMI cable to the HDMI port on a PC or Mac.
- 5) CONNECT POWER CORD:** plug the one end of the power cord into the 12V DC port on the top of the camera and the other into a 120V AC outlet.
- 6) SET YOUR MONITOR SIGNAL TO HDMI:** be sure to set your monitor's input signal to HDMI to enable it to see your camera.
- 7) POWER ON THE CAMERA:** *(Before turning on your camera, be sure your microscope is turned on and light is going to your photo port)* - press the ON/OFF (power) button on the the camera – a blue light on will come on indicating the camera is ready. (A red light indicates stand-by mode.) **THE 4K CAMERA MAY TAKE UP TO 15 SECONDS TO START.**

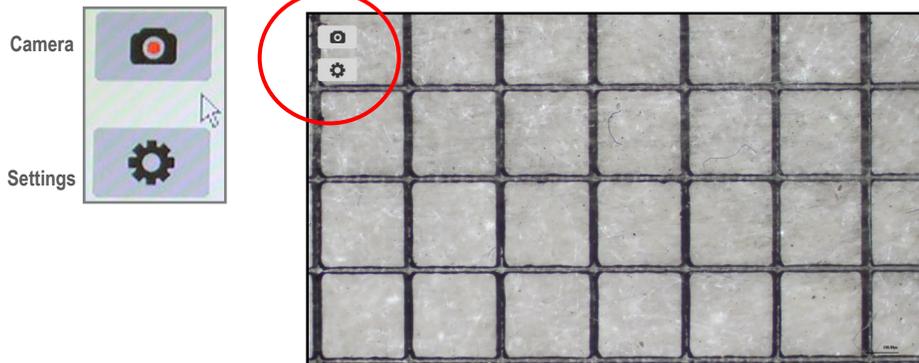


STAND-ALONE CAMERA OPERATION WITH BUILT-IN SOFTWARE

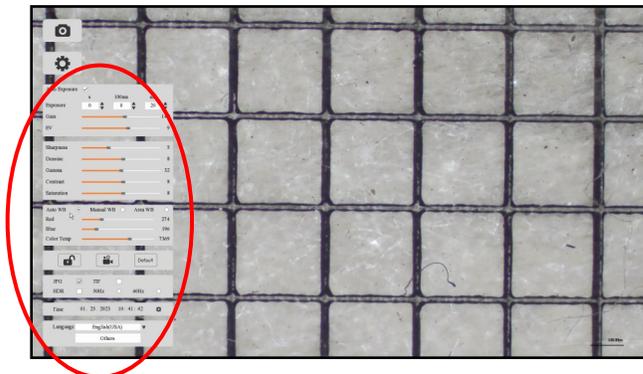
NOTE: Different camera models have slightly different functions (i.e., EXCELIS vs. EXCELIS LITE vs. EXCELIS 4K). Please refer to the software interface on your camera’s built-in software for available features.

VIEWING & ADJUSTING AN IMAGE

- 1) **CAMERA MENU & SETTINGS:** With your camera connected mouse, navigate to the TOP LEFT area of your monitor – as you hover there, a CAMERA ICON and SETTINGS ICON will appear on the display.



- 2) **ADJUSTING DISPLAY SETTINGS FOR YOUR LIVE IMAGE:** With a specimen on the microscope, CLICK the SETTINGS ICON — this will bring up the SETTINGS MENU. The camera automatically defaults to “Auto Exposure” which chooses the best settings based on the sample and illumination. To adjust settings, simply UNCLICK Auto Exposure.



From the SETTINGS MENU you can adjust:

Exposure, Gain, Gamma, Contrast, Saturation, Color, Brightness, Sharpness, and Denoise

It is recommended you adjust your image here and save before

VIEWING AND ADJUSTING *(continued)*



AUTO EXPOSURE: Check [Auto Exposure] to automatically adjust the exposure time.

EXPOSURE TIME: Uncheck [Auto Exposure] then manually adjust the exposure time from 0ms~1sec.

GAIN: Adjust Gain to increase brightness. Higher Gain also increases noise in the image.

EV: Manually adjust the Exposure Value used as the target brightness for [Auto Exposure]. This setting only takes effect in [Auto Exposure] mode.



SHARPNESS: Improves clarity of image.

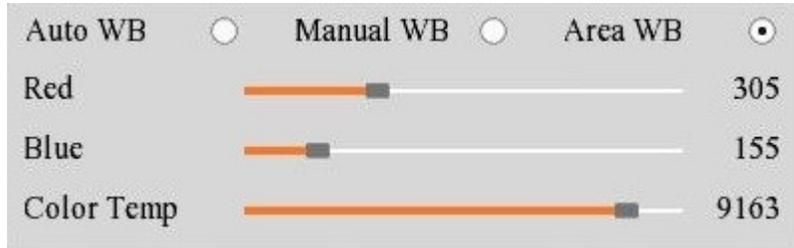
DENOISE: Averages adjacent frames of live image, and filters out non-overlapping information.

GAMMA: Adjusts median level.

CONTRAST: Adjusts ratio between darkest and brightest areas of the image.

SATURATION: Increases or decreases the intensity of colors.

VIEWING AND ADJUSTING *(continued)*



AUTO WB: Click to turn on Automatic White Balance. Red and Blue are automatically adjusted.

MANUAL WB: Manually adjust Red and Blue to achieve color balance in image.

AREA WB: When selected, an Area White Balance frame appears in the image. Adjust position and size of frame to desired location. Selecting Manual WB afterwards will lock the white balance setting.

RED and BLUE: Adjust the red and/or blue levels in the image. Green is set automatically and cannot be changed.

COLOR TEMP: Manually adjust the color temperature to compensate for illumination sources and environmental conditions.



LOCK: Click the [Lock] icon to lock the camera settings, then only allow image or video capture without ability to change parameters.

VIDEO: Click [Video] to start recording video. Click it again to stop recording.

DEFAULT: Returns all image and camera settings to factory default.

VIEWING AND ADJUSTING *(continued)*



JPG: A lossy compressed image file format that saves a smaller image file size, but sacrifices some image quality

TIF: Lossless image file format that saves all image data. (Recommended for highest image quality.)

HDR: Provides more dynamic range and image detail.

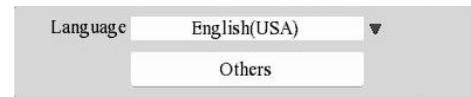
LIGHT SOURCE FREQUENCY: Change between **50Hz** and **60Hz** to reduce stroboscopic flickering in image. Default is DC.



Click the gear icon to change the date and time that are saved with images.

NOTE: This feature is not available on the EXCELIS LITE series cameras.

LANGUAGE: Choose the language for the software interface.



OTHERS:

PARAMETER SETTING: Copy the camera settings to use on other cameras.

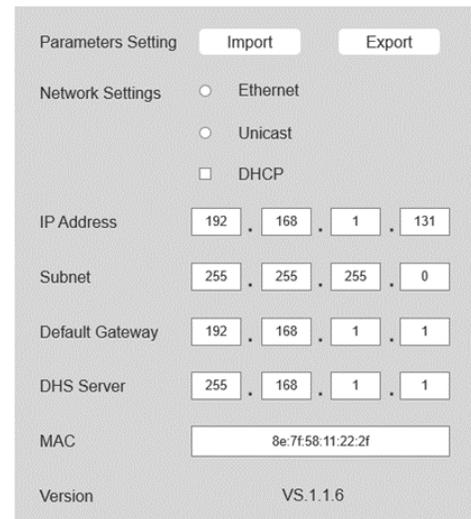
EXPORT: Exports the parameters file to the external storage device (USB stick or SD card).

IMPORT: Imports the parameters file from an external storage device (USB stick or SD card).

NETWORK SETTINGS: Display and network parameters. Only available for cameras with Ethernet ports.

VERSION: Displays the camera's firmware version.

RESTORE FACTORY SETTINGS: Click to restore camera settings to factory default.



CAPTURING AN IMAGE

CAPTURE AN IMAGE: To capture an image, CLICK the CAMERA ICON – the image will be saved to the SD card in JPEG format (.jpg). The camera will revert back to live view after image is captured.

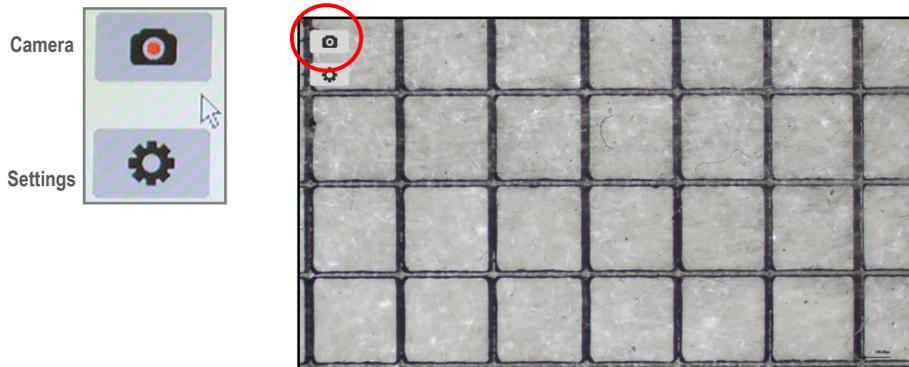
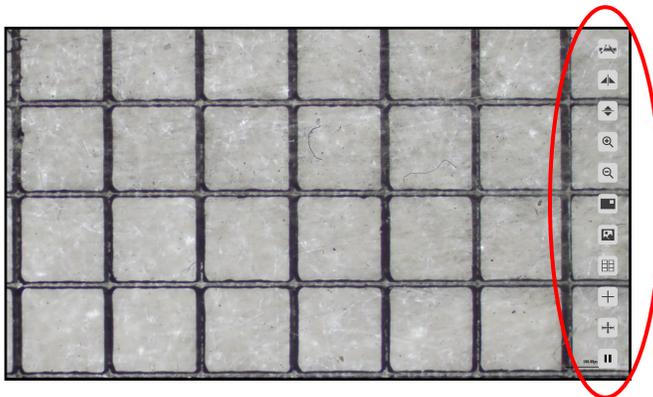


IMAGE TOOLS

MANIPULATING/CHANGING AN IMAGE: Move the camera mouse to the top right side area of your monitor — the IMAGE TOOLS icons appear.

NOTE: Some tools are not available on EXCELIS LITE cameras. Refer to the next page.



The image tools allow you to:

- Flip SAVED Images (horizontally or vertically)
- Zoom In or Out
- Mask
- Insert a Crossline
- Measure
- Compare Images
- Browse Images on the SD card.

IMAGE TOOLS *(continued)*

 Indicates this feature available only on Excelis 4K and AU-600-HD cameras with SN# ending with “-M” or “-MC” (i.e., 1707001-M).

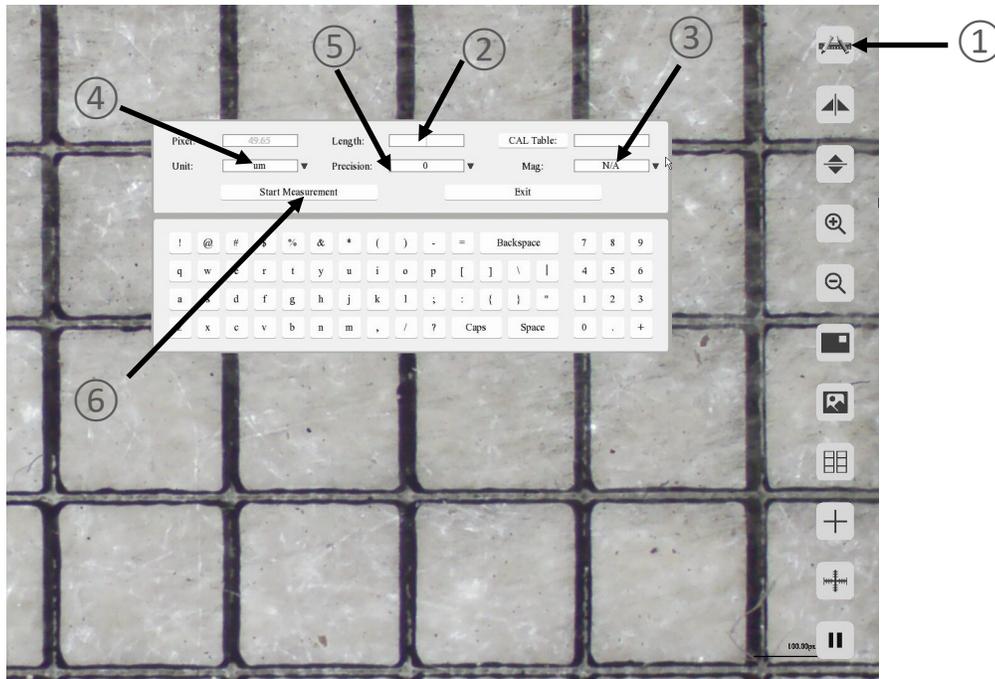
		CALIBRATION: Allows measurements to be taken.
		HORIZONTAL FLIP: Flips a saved image on the SD card on its horizontal axis.
		VERTICAL FLIP: Flips a saved image on the SD card on its vertical axis.
		ZOOM IN: Zooms in on an area of the saved image on the SD card.
		ZOOM OUT: Zooms out on an area of the saved image on the SD card.
		MASK: Enables temporary covering of portions of an image.
		BROWSER: Allows you to view saved images/video on the SD card.
		COMPARISON BROWSER: Allows you to compare saved images on the SD card with the live view.
		CROSSLINE: Inserts a crossline on a saved image on the SD card.
		RULER: Overlays a ruler with an X and Y scale on the image.
		FREEZE: Freezes live preview. Click again to return to live preview.

IMAGE TOOLS (continued)

★ Indicates this feature available only on Excelis 4K and AU-600-HD cameras purchased after July 1, 2017 and with SN# ending with “-M” or “-MC” (i.e., 1707001-M).

★ **CALIBRATION ICON**

To perform a measurement, follow these steps:



- 1) Place a stage micrometer on the microscope and, using the objective/magnification of your choice, focus on the stage micrometer.
- 2) **CLICK** on the **CALIBRATION** icon ① at the top right of your monitor.
- 3) Using the mouse, **CLICK** and **HOLD** left mouse button to **DRAW A LINE** of a known length and **RELEASE** and **CLICK** at the end of the measurement. Enter the length value in the “Length” box ② using the on-screen keypad.
- 4) Enter the **MAGNIFICATION** of the microscope (e.g., objective magnification) used during the observation of the line drawn for the calibration in the “Mag” box ③ using the onscreen keypad. The user can select from specific magnification values already pre-entered via the arrows on the side of the box, or enter any value of their choosing using the onscreen keypad.
- 5) Confirm the **UNIT** ④ and **PRECISION** ⑤.
- 6) To **SAVE THE CALIBRATION**, click **START MEASUREMENT** ⑥. Enter a name for the calibration and click OK.

IMAGE TOOLS (continued)

★ Indicates this feature available only on Excelis 4K and AU-600-HD cameras purchased after July 1, 2017 and with SN# ending with “-M” or “-MC” (i.e., 1707001-M).

★ **SCALE DISPLAY & SELECTION FEATURE**

The scale bar can be displayed on the screen which corresponds to the length set during the measurement calibrations. The scale bar can be quickly selected from the first 10 saved calibration tables.

To display the scale bar, **CLICK** the **CALIBRATION** icon ①, then **CLICK** “Start Measurement”.

RIGHT CLICK to bring up the measurements menu, then **CLICK SCALE BAR** ②, then **CLICK SET SCALE** ③ to show saved calibrations. **With the mouse, CLICK** to select one of the saved settings. The scale bar for that setting will appear on the bottom right of your display. Other measurements on the live image will be updated to reflect the newly selected calibration. Click **EXIT** to exit the measurements menu.



IMAGE TOOLS *(continued)*

★ *Indicates this feature available only on Excelis 4K and AU-600-HD cameras purchased after July 1, 2017 and with SN# ending with “-M” or “-MC” (i.e., 1707001-M).*

★ MASK ICON

The mask feature allows the user to highlight an area of the image to demonstrate, operate or explain. This feature temporarily blacks out unselected parts of the image. MASK does not reduce the image size or the number of pixels on the camera sensor that are being used so frame rate and image file size are not affected by applying a mask.

To apply the mask, **CLICK** the **MASK** icon , and **CLICK** and **DRAG** the mouse/hand cursor over the area you want to highlight, then let go.

You can then move the mask to other areas of your image by **CLICKING**, **HOLDING** and **DRAGGING** the box (masked area) around.

To turn off the mask feature, **RIGHT CLICK**.

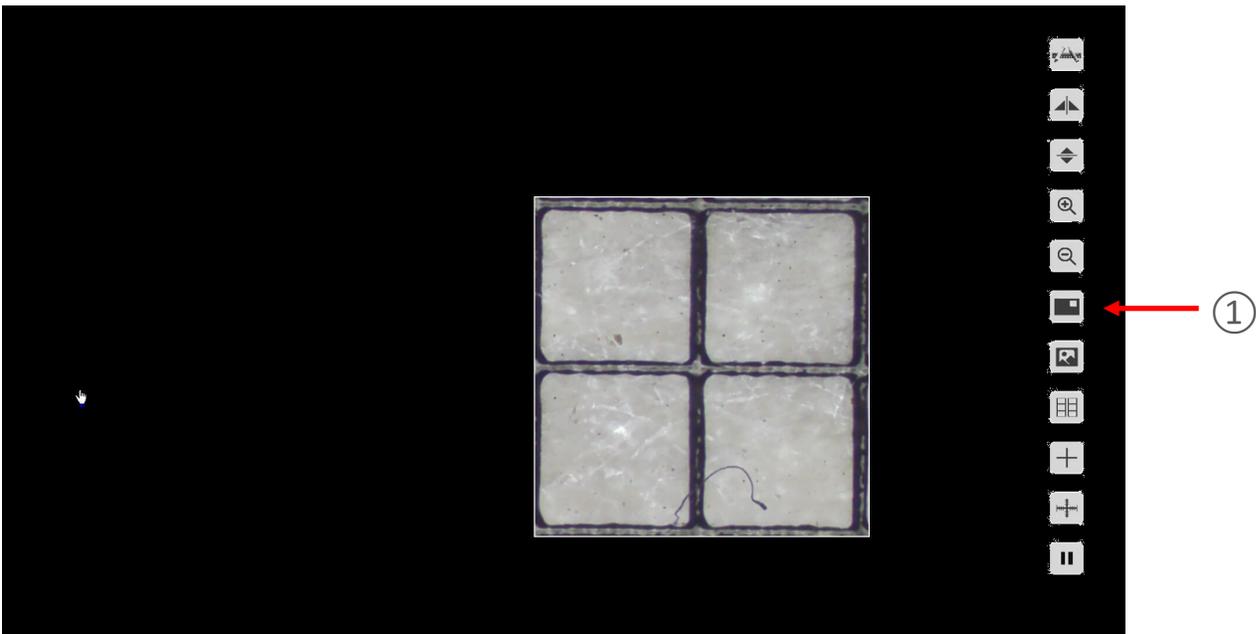


IMAGE TOOLS *(continued)*

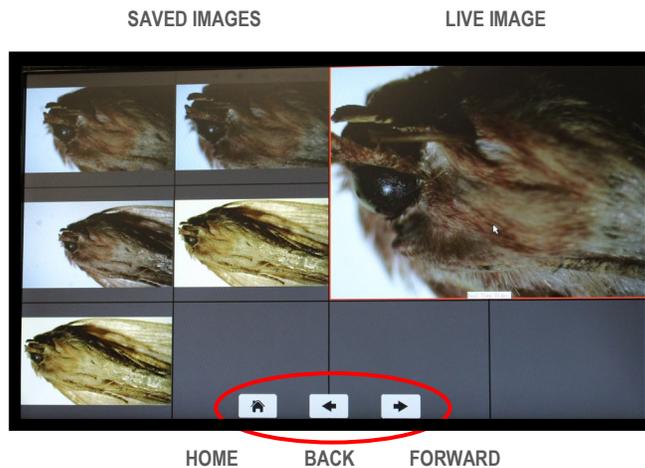
COMPARISON BROWSER ICONS

The comparison browser allows you to compare saved images on the SD card with the live view.

HOME: brings you back to the previous screen.

BACK: brings you to the previous page of saved images (if there is one).

FORWARD: brings you to the next page of saved images (if there is one).



BROWSER ICONS

The browser allows you to view, select or delete saved images and video on the SD card.

HOME: brings you back to the previous screen.

BACK: brings you to the previous page of saved images or video (if there is one).

FORWARD: brings you to the next page of saved image (if there is one).

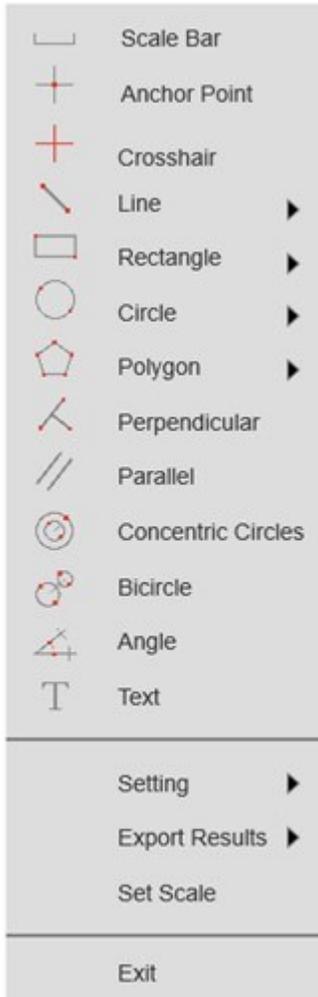
DELETE: allows you to delete images and videos off the SD card.



MEASUREMENTS

Measurements can be performed on live images, and the results can be saved with the image (a.k.a. burned into the image). Right-click the mouse to display the measurements tool bar.

NOTE: EXCELIS LITE cameras do not support measurement functions.



SCALE BAR: Click to turn the scale bar on or off.

ANCHOR POINT: Shows XY coordinates of selected points.

CROSSHAIR: Use the mouse cursor as the center point and extend the cross line in the horizontal and vertical direction.

LINE: Draw an arbitrary, horizontal or vertical line. Length is calculated.

RECTANGLE: Draw a rectangle. Choose to show height, width, perimeter or area.

CIRCLE: Choose type of circle and to display radius, perimeter, or area.
 Center Point: Click to specify center of circle.
 Two Point: Draws circle by specifying the ends of the diameter.
 Three Point: Use three points to draw the circle.

POLYGON: Draw a polygon and choose to measure perimeter or area.

PERPENDICULAR: Measure a perpendicular length to a reference.

PARALLEL: Measure distance between two parallel lines.

CONCENTRIC CIRCLES: Measure diameters of two concentric circles (they share the same center point).

BICIRCLE: Measure the distance between the center points of two circles.

ANGLE: Measures the angle.

TEXT: Add text notes (annotations).

SETTING: Adjust the measurement properties. Changes apply to all measurements currently on the image. (Options include: Line Width, Line Color, Font Size, Font Color.) Magnifier provides a zoomed in view of an area of the image allowing better measurement point location.

EXPORT RESULTS: The measurement data can be exported to the external storage device (USB stick or SD card) as Excel or text file.

SET SCALE: Change the scale settings to another calibration (e.g., 4x to 10x). Measurements reflect the new scale setting.

EXIT: Exit the measurement operation.

Copying/Retrieving Images From the SD Card to a PC or Mac

For *Excelis HDMI*, remove the SD Card and insert into any SD reader to copy images and video from the card to your PC or Mac.

For *Excelis 4K* remove the USB flash drive and insert into any USB port on your PC or Mac to copy/transfer images and video.



CaptaVision+ Imaging Software

For More Image Control

For more image control, analysis and annotation of images, use *CaptaVision+* imaging software that came with your camera. You can download the latest version of *CaptaVision+* from <https://accu-scope.com/support/software-updates>.

NOTE: *CaptaVision+* imaging software is compatible with Windows 7, 8, 10 and 11 (32 or 64 bit), and Mac OS 10.4 and higher

INSTALLATION ON A PC:

- 1) Find the EXE file "*CaptaVision+* Setup" on the USB flash drive, and double-click it to install the software and driver.
- 2) Follow the installation steps to finish the installation. After the installation, the application software "*CaptaVision+*" shortcut icon will be created on the desktop.
- 3) Connect the camera to the PC.
- 4) Double-click on the *CaptaVision+* shortcut icon to start the *CaptaVision+* imaging software and to view a live image from the camera.

INSTALLATION ON A MAC:

- 1) The *CaptaVision+* icon will appear in a new Finder window. Drag the icon to the desktop or copy it to the Applications folder.
- 2) Connect the camera to the Mac computer.
- 3) Double-click the *CaptaVision+* icon to start the software and to view a live image from the camera.

For information on how to use CaptaVision imaging software, please refer to the CaptaVision Manual PDF included on the USB flash drive that came with your camera.

Limited Warranty

Digital Cameras for Microscopy

This digital camera is warranted to be free from defects in material and workmanship for a period of one (1) year from the date of invoice to the original (end user) purchaser.

This warranty does not cover damage caused in-transit, damage caused by misuse, neglect, abuse or damage resulting from either improper servicing or modification by other than ACCU-SCOPE or UNITRON approved service personnel. This warranty does not cover any routine maintenance work or any other work that is reasonably expected to be performed by the purchaser. No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage or other conditions beyond the control of ACCU-SCOPE Inc. This warranty expressly excludes any liability by ACCU-SCOPE INC. and UNITRON Ltd for consequential loss or damage on only grounds, such as (but not limited to) the non-availability to the End User of the product(s) under warranty or the need to repair work processes.

All items returned for warranty repair must be sent freight prepaid and insured to ACCU-SCOPE INC., or UNITRON Ltd., 73 Mall Drive, Commack, NY 11725 – USA. All warranty repairs will be returned freight prepaid to any destination within the Continental United States of America. Charges for repairs shipped back outside this region are the responsibility of the individual/company returning the merchandise for repair.



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