Measurement calibration in IPM Scope Software
An example using a circular object

The IPM Scope Software is capable of precise measurement using a number of different measurement tools. To use the measurement tools it is necessary to calibrate the software with the imaging instrument. You will need to set up your instrument at the magnification at which it will be used for measurement.

For this example, we will use a ZDM1 Portable Digital Video Microscope with a 9 – 65x magnification range. Here we will calibrate our instrument at 65x magnification. The following are the steps used to calibrate the software for precise measurement:

1. Select an object of known size to use for calibration. A good choice, depending on the field of view, is a washer, drilled hole on a circuit board, precision ball bearing or calibration target. If possible, purchase a precision calibration reticule. The object should be 25 – 75% of the field of view to achieve the best precision. Make sure you know the size of the object with good precision.

For this demonstration we are using a 1mm circular hole on a circuit board. Our digital video microscope is operating at 65x magnification.

2. Select the settings button to open the settings window.
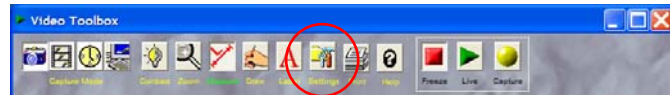
3. Select the measurement option from the list on the left. Choose a measurement tool. For circular objects the *crosshair cursors* are the best tool. For measuring a linear reticule, try the *line with guides*.
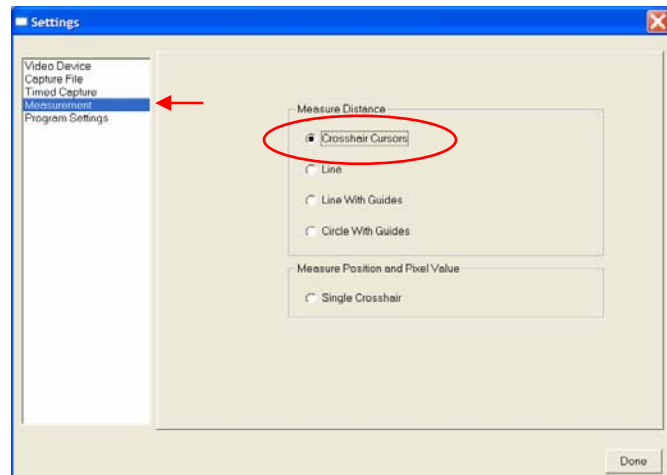
For this demonstration we will choose the *crosshair cursors*. Press the Done button when finished.

4. Press the measurement button to display the on-screen measurement tool.


5. Position the measurement cursors until they span the calibrated target. The size of the object in pixels is displayed at the top of the image. Click the mouse over either cursor to drag it into position. Click the mouse between the cursors to move them together.

In this demonstration, the *crosshair cursors* are placed along the sides of the circular hole. The x-distance represents the width of the circle; the y-distance represents the height of the circle; the L-distance represents the distance from the red crosshair to the blue crosshair. Note that the L-distance is not relevant to measuring the size of the circle.
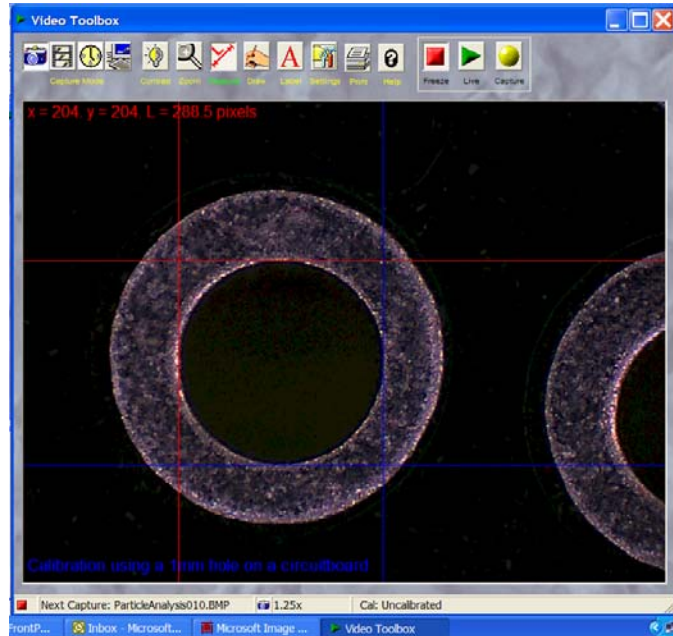

6. Move the mouse over the status bar at the bottom of the screen where the label *Cal: Uncalibrated* is located. Notice that the arrow pointer changes to what looks like a menu list. The Cal portion of the status bar is the calibration hot spot. Left click the mouse to bring up the calibration menu. The calibration menu allows you to select a previous calibration setting or to create a new calibration.

In this demonstration we will create a new calibration by selecting the *Calibrate...* option.
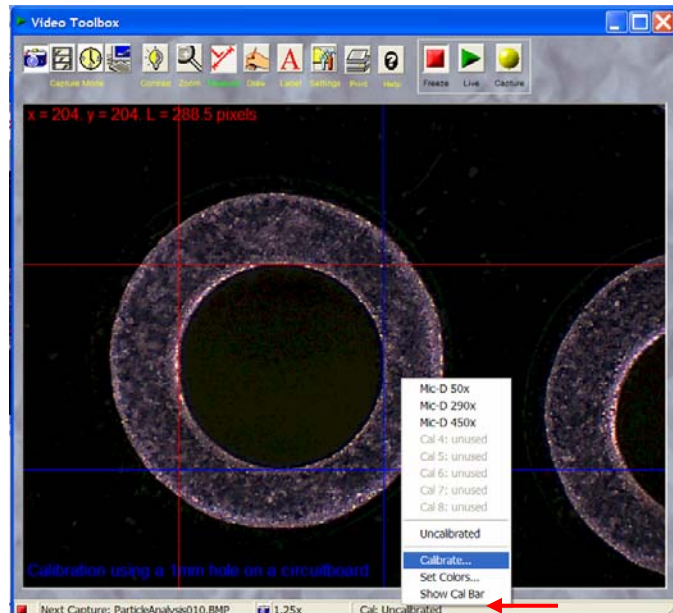
7. The calibration window will allow you to create and save a calibration setting. Up to 8 different calibration settings can be saved. The different calibrations might correspond to different objectives on a compound microscope or different zoom settings on a video microscope lens.

Select a calibration number, and fill in the information for the calibration. Two different kinds of calibrations are possible, labeled "*Calibrate by X and Y*" or "*Calibrate by L.*" For circular objects measured with the crosshair cursors you will use the *Calibrate by X and Y* option. For linear targets measured with the *line* or *line with guides* you will use the *Calibrate by L* option.
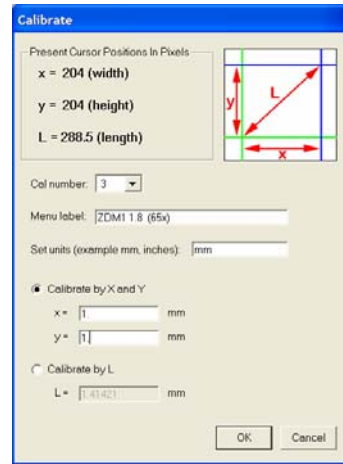
In this demonstration we will use the *Calibrate by X and Y* option. We enter a name in the menu label which will be displayed on the cursor menu. We select mm for our units and enter it into the *Set units* selection. We click on the *Calibrate by X and Y* option and enter the width and height of the circular hole; in this case 1 mm.

When finished press the OK button.

8. The IPM Scope Software measurement tool is now calibrated. Note that on the status bar at the bottom, the cal now reads
the new calibration setting we just created. Note also that the values at the top of the screen now show the circular hole is 1 mm in diameter.
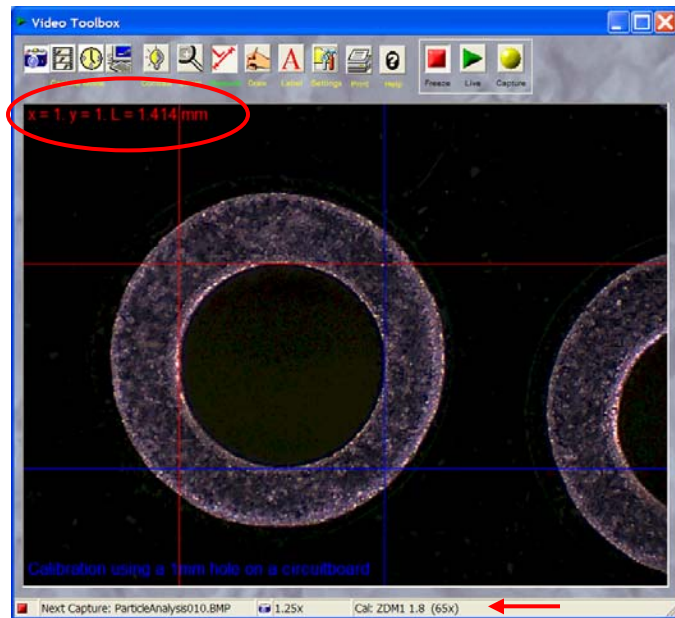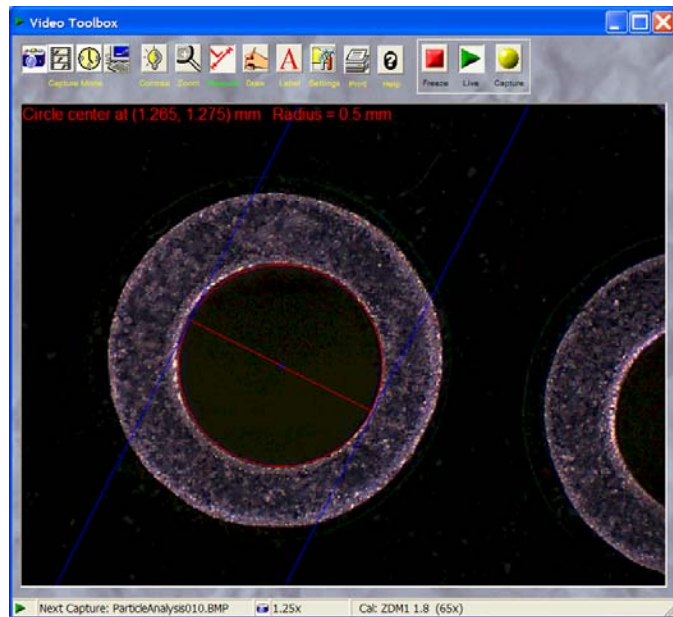
Once the IPM Scope Software is calibrated, the measurement tools can be changed while still displaying calibrated measurement results.

Here we switch to the *line with guides* tool to measure the width of the annular ring.
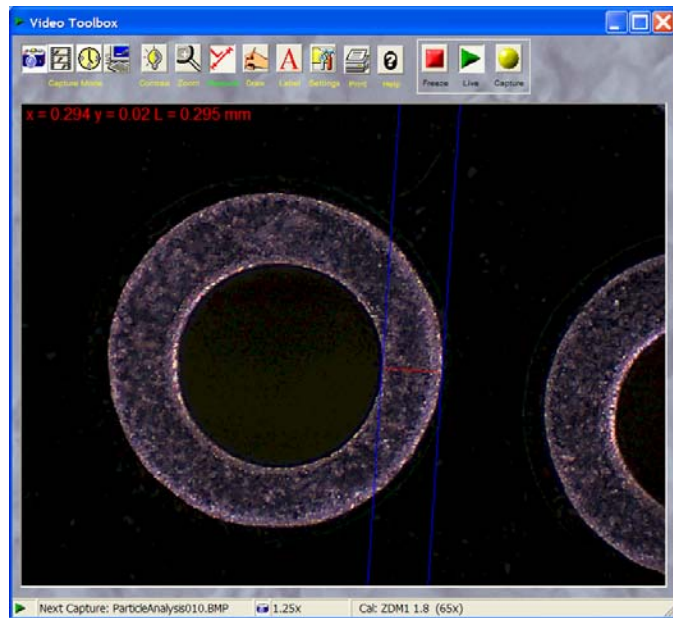
Here we switch to the *circle with guides* tool to measure directly the radius and center of the circular hole on the screen.

For high precision measurement, you can use the zoom button to increase the magnification of the image. The IPM Scope Software provides a high resolution digital zoom without the pixilation effect found on most other programs (including expensive packages such as Photoshop). Note that the measurement tools are visible and adjustable at all magnifications. Here we carefully position the measurement tool at higher magnification to precisely trace the perimeter of the hole. We can switch between different zoom settings while performing our measurements.
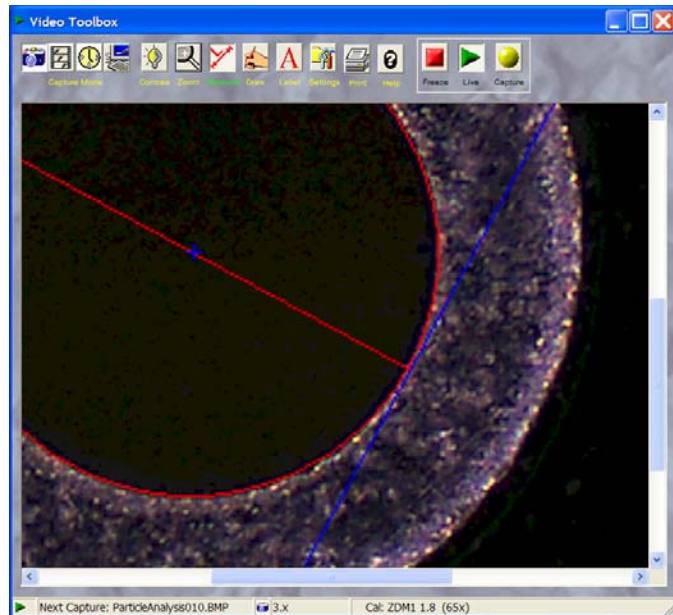
Technical Support

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