

## **Nikon M-22U Measuroscope with QC-5200 Software with Video Edge Detection**

The Measuroscope is used to measure the lateral distance between two features on a substrate. The system uses video edge detection to reduce operator error by removing judgment inconsistencies. Resolution depends on magnification of objective and type of detection selected. Minimum resolution is 100 nm for 100x objective and video edge detection.

### Video Edge detection

- Detects edges from distinct variations in field intensity
- Must have objective selection on the screen the same as the objective in use.

### Probes

- Singly 'fired' by pressing the center scroll button on the mouse.
- Continuously fired by selecting 'continuous fire' on menu created by right clicking over video view.

### To acquire points:

1. Select a feature measurement (on upper center menu) or use Measure Magic
2. Select a probe
  - a. One of those listed above, or
  - b. New probe can be used by selecting a point or multiple points depending on if measuring a point, line, or arc/circle (1, 2, or 3 points, respectively). The last point selected should be 'dragged' across the edge by the mouse to create the proper probe.
3. Position the probe over the video image
4. Size the probe
5. Select direction of scan (light to dark, dark to light, or first edge)
6. Click the center mouse button to fire

### Optical Probe

- Crosshair – measures a single point in the x-y space
  - Use when manually or visually collecting a single point

### Probes using Video Edge Detection

- Simple
  - Measures a single point at a detected edge crossing
- Buffer
  - Measures a line at an edge crossing
  - Acquires many points along an edge each time it is fired.
  - The number of points
- Average
  - returns the average point location of all points acquired along an edge transition by a buffer-like probe

- Nearest
  - Returns the nearest point location of all points acquired along an edge transition by a buffer-like probe
  - Probe should be oriented properly to choose the ‘nearest’ point from the back edge of the probe.
- Farthest
  - Returns the farthest point location of all points acquired along an edge transition by a buffer-like probe
  - Probe should be oriented properly to choose the ‘farthest’ point from the back edge of the probe.
- Width
  - Returns a Distance comprised of 2 opposing points located at the average width of a line.
  - Measures line widths that are returned as Distances in the Features template.
- Circle
  - Measures circles and arcs at edge crossings
  - To measure arcs, select circle probe, select the circle dividing line, drag this line to open the circle to the approximate arc length.
- Blob
  - measures the area, perimeter, and maximum and minimum distances of an irregular shape.
  - To use, select Blob feature measurement, the Blob probe, position it around the feature, then fire the probe.
- Worm
  - Measures regular and irregular shapes, completely within or extending beyond the field of view
  - Generates a series of scans perpendicular to and across the perimeter of a feature edge in the direction indicated by the probe.
  - Toggle green / red frame for beyond / within field of view, respectively.
  - Scans can be terminated by the ‘stop sign’ octagonal shape when separated from the probe (double-click over probe center) and shifted (dragged) to the terminating site.
- New
  - Used to create a new Simple, Buffer, Circle, or Worm probe quickly by clicking and dragging the mouse cursor within the live video window over the feature edge.
- Pattern finder
  - Used to learn and later to find a regular or irregular feature
- Video charts
  - Imports an overlay chart from a drawing file to be used in a visual pass / fail inspection
- Skew line – levels reference frame in x,y