



# Applied Scientific Instrumentation

## Linear Encoder Options

All of the servo motor stages that ASI offer come with standard rotary encoders that either monitor the fine focus shaft of the microscope as shown in Figure 2, or the position of the motor shaft that drives the lead screw of the XY stage. Although these rotary encoders work very well with ASI's anti-backlash algorithm (see Figure 4a versus 4b), the overall positioning and repeatability accuracies can be increased by utilizing linear encoders. As shown in Figures 1 & 3, placing the encoder closer to the sample to be monitored provides a tighter feedback loop. The result is shown in figure 4c. For more information please refer to ASI Technical Notes TN105 Stage Repeatability Tests, and TN106 Theory of Linear Encoders.



Figure 1. The optional Z-Axis linear encoder monitors the position of the stage.

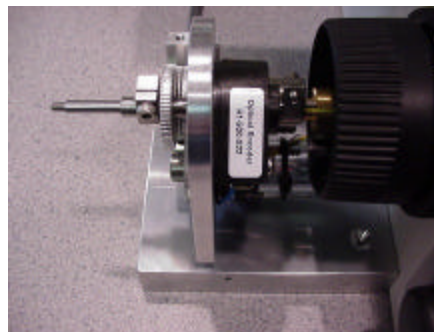


Figure 2. The standard rotary encoder monitors the fine focus shaft.

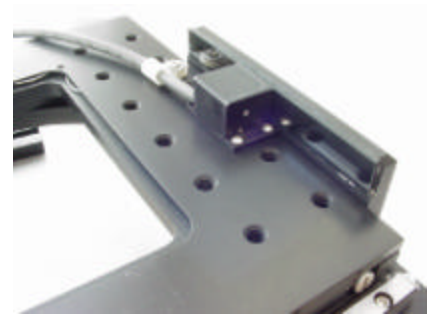
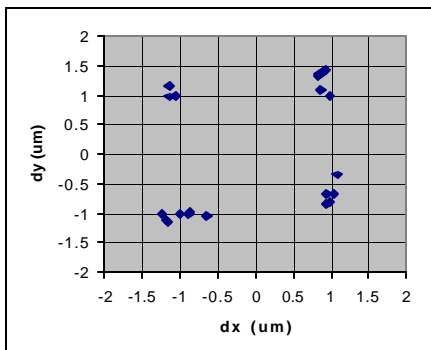
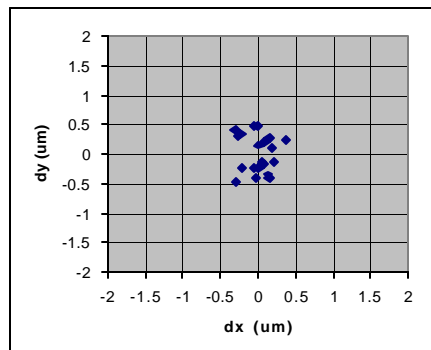


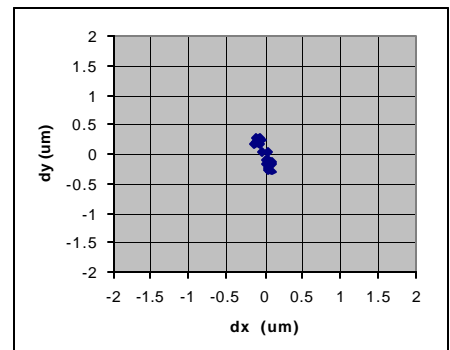
Figure 3. The optional XY linear stage encoders are mounted directly on the X & Y plates of the stage, whereas the standard rotary encoders monitor the position of the motor shaft that drives the lead screw.



a.



b.



c.

Figure 4: Return coordinates after twenty 1.1mm radius, random direction moves. a) Standard stage, rotary encoders, without backlash correction; b) same stage with backlash correction; and c) a linear encoder equipped stage.



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