Nanopositioning in microscopy with precise and accurate motion

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The exact positioning of a sample or the microscope optics has a decisive influence on the quality of the results. This is particularly the case with newer microscope technologies such as super-resolution microscopy, light sheet or multiphoton microscopy where the positioning speed is also decisive for the result.

PI will present an overall piezo-based solution for the majority of highly accurate positioning tasks within any kind of microscopy technology. Nanometer accuracy within several hundred microns of travel inside a complex mechanical microscope set-up is only possible by individual adjustment and tuning of stages and scanners according to objective weight and stage set-up.
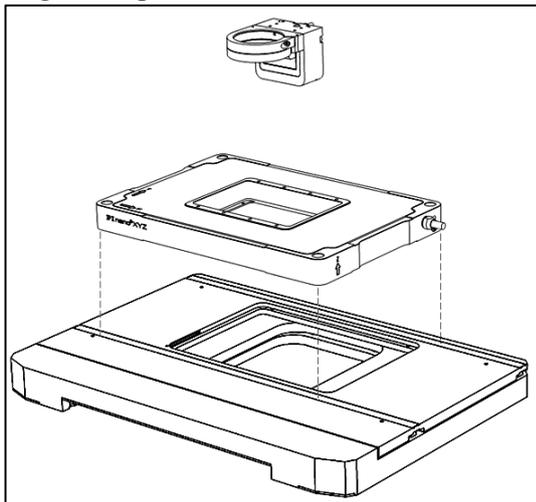

Figure 1: Combination of a flat sample stage and small-sized objective scanner

We will show examples of measurements made under realistic load conditions as well as possible options for tuning and the effect of this on the PIFOC's Z trajectory.

PI is able to individually tune each piezo scanner or stage according to the users' needs to achieve the best performance with any objective or stage set-up.

Another aspect in all commercial, or more important, in customized microscopes, is the Z height of the sample stages. PI is able to provide ultrathin XY stages that use our piezo motor technology. These stages offer fast and accurate motion, and also positioning capabilities in automated or semiautomated applications.

Last but not least, PI's controller solutions offer full integration into MetaMorph® Microscopy Automation & Image Analysis Software as well as µManager. All controllers with the PI GCS2 command set are supported and PI always tests new controllers with the latest version of both imaging solutions. For highly customized solutions, PI also offers a wide variety of LabView VIs for implementation into individual command and control software.