

NanoScan OP400

Nanopositioning Piezo Objective Scanner

The NanoScan OP400 provides the fastest step and settle time of any objective positioner available.

Its market leading positioning accuracy and resolution originates from its unique mechanical design and integral capacitive feedback sensors.

Compatible with most microscopes and objective lenses, the OP400 has user configurable settings optimized for different objective sizes, weights, and performance needs. You simply select the best setting for your particular application using the software application provided.



Key features

- 400µm closed loop travel range (480µm open loop range)
- Rapid settling times even with large mass objectives
- Stainless steel construction provides greater mechanical stiffness (faster) and temperature stability (lowest drift)
- Friction free flexures deliver high stiffness and minimize off-axis motions for the highest repeatability and fastest cycle times
- Tested to perform for more than 10 million full range cycles
- Capacitive positioning sensors used to give sub nanometer positioning and the best resolution, stability (low drift, and repeatability).
- Suitable for upright and inverted applications
- Connectors with built in stage calibration provide plug and play electronics which can be interchanged, minimizing system down times

Applications

- Optical sectioning producing 3D images
- Autofocus systems for time lapse imaging
- High content screening
- Surface analysis
- Wafer inspection
- Scanning interferometry
- Multiphoton Microscopy

Specifications for NanoScan OP400 Positioner:

| Parameter | Specification |
|---|--------------------------------|
| Material | Stainless Steel |
| Stage mass | 439g |
| Closed Loop Range | 400µm |
| Resolution* | 0.7nm under 150g load |
| Linearity* | 0.005% |
| Repeatability* | 1.6nm Slow PID, 50µm step, 1SD |
| Max. Objective Load | 800g (higher loads on request) |
| Loaded Resonant Frequency* | 180Hz under 150g load |
| 5% Settle 0.5µm Step 150g/250g/500g Load* | 7ms/10ms/18ms |
| 0.5% (500nm) Settle 100µm Step 150g/250g/500g Load* | 30ms/ 35ms/45ms |
| Cable Length | 2m |
| Objective Clearance | 40mm |
| Optical Path Length Extension | 13mm 12 mm with M32 |

*Typical specifications

Notes: Please, specify when ordering objective to be used.

Specifications for NPC-D-6110 Controller

| Parameter | Specification |
|--|---|
| Mechanical | |
| NPC-D-6110 Controller Box | 318mm x 240mm 90mm |
| Weight of Controller Box | 3.0 kg |
| Cooling | Convection cooled - temperature controlled fans |
| Electrical | |
| Power input | 100 to 240 VAC nominal 47 to 63 Hz |
| Connectivity | |
| USB - Type B Connector | 2.0 compliant |
| Analog input command | BNC - 0 -10V (+/- 10V max) |
| Analog position monitor output | BNC - 0-10V (+/- 10V max) |
| “TRIG” input/“TRIG” output “IN-POS” output and quadrature interface | 25 pin D-type socket - 5V TTL |
| Controller synchronizing signals | 9 pin D-type socket |
| Enviromental - Operational | |
| Temperature | 10 to 40C |
| Relative humidity | 5 to 80% |

*Typical specifications

NanoScan OP400 System Ordering Information

| Part Number | Description |
|--------------------------|---|
| QGOP400-UP-D1 | System incorporating NanoScan OP400 (0-500g load) for upright microscopes using objective lenses and NPC-D-6110 controller |
| QGOP400-INV-D1 | System incorporating NanoScan OP400 (0-500g load) for inverted microscopes using objective lenses and NPC-D-6110 controller |
| QGOP400-UP-HL-D1 | System incorporating NanoScan OP400 (350-800g load) for upright microscopes using objective lenses and NPC-D-6110 controller |
| QGOP400-INV-HL-D1 | System incorporating NanoScan OP400 (350-800g load) for inverted microscopes using objective lenses and NPC-D-6110 controller |

Microscopes Thread Adapter Ordering Information

| Part Number | Description |
|----------------------|--|
| QG-OP-MIC-RMS | Microscope adapter RMS |
| QG-OP-MIC-M25 | Microscope adapter M25 x 0.75 |
| QG-OP-MIC-M32 | Microscope adapter M32 x 0.75 |
| QG-OP-MIC-M27 | Microscope adapter M27 x 0.75 |
| QG-OP-MIC-W26 | Microscope adapter W26 (M26 X x 1/36") |

Objective Lens Adapter Ordering Information

| Part Number | Description |
|----------------------|---|
| QG-OP-OBJ-RMS | Objective adapter M32 x 0.75 to RMS |
| QG-OP-OBJ-M25 | Objective adapter M32 x 0.75 to M25 x 0.75 |
| QG-OP-OBJ-M27 | Objective adapter M32 x 0.75 to M27 x 0.75 |
| QG-OP-OBJ-W26 | Objective adapter M32 x 0.75 to W26 (M26 x 1/36") |

Parfocal Objective Spacer Ordering Information

| Part Number | Description |
|------------------------|---|
| QG-OP-SPACE-RMS | Objective lens spacer RMS |
| QG-OP-SPACE-M25 | Objective lens spacer M25 x 0.75 |
| QG-OP-SPACE-M32 | Objective lens spacer M32 x 0.75 |
| QG-OP-SPACE-M27 | Objective lens spacer M27 x 0.75 |
| QG-OP-SPACE-W26 | Objective lens spacer W26 (M26 x 1/36") |

NPC-D-6110 Controller

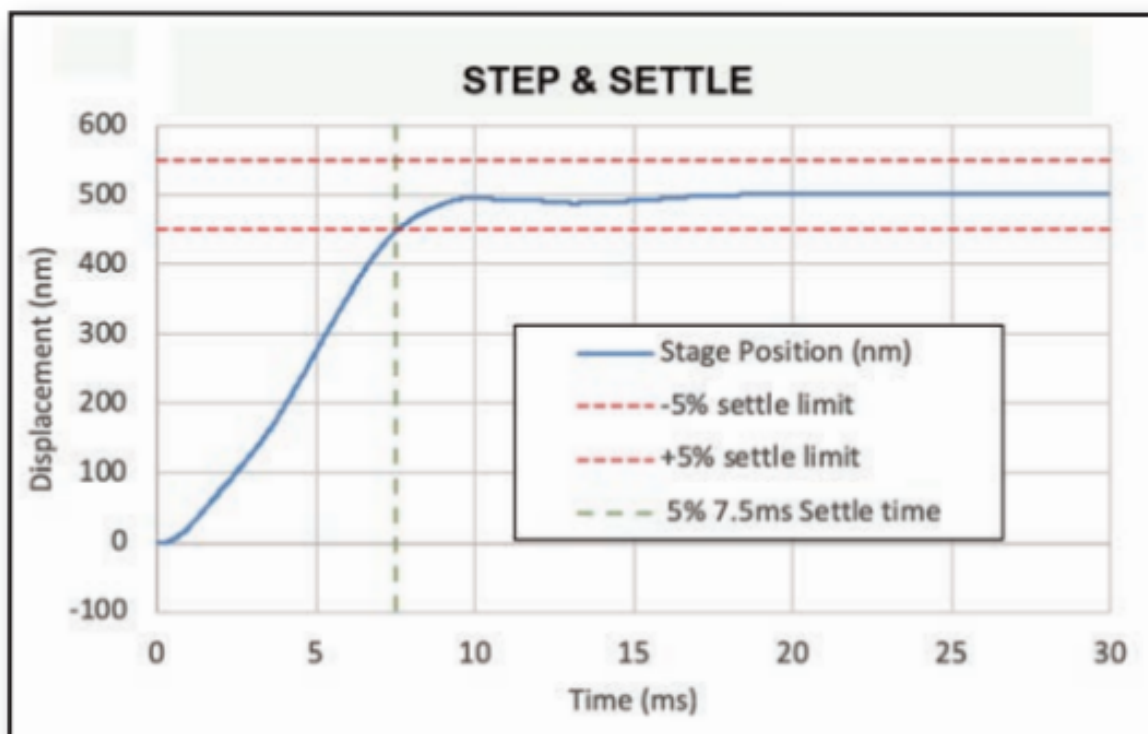


- The powerful digital controller drives the OP400 at the fastest speeds possible.
- Motion control algorithms with acceleration/deceleration control and active damping reduce overshoot.
- Velocity control algorithm gives ultra-smooth ramps for applications such as focus stacking or focus bracketing.
- Market-leading 20 μ s update rate
- Fastest recovery time between z-stacks, providing enhanced time resolution
- Selectable tuning presets which optimize for step settle with different loads such as incubator

Interfacing

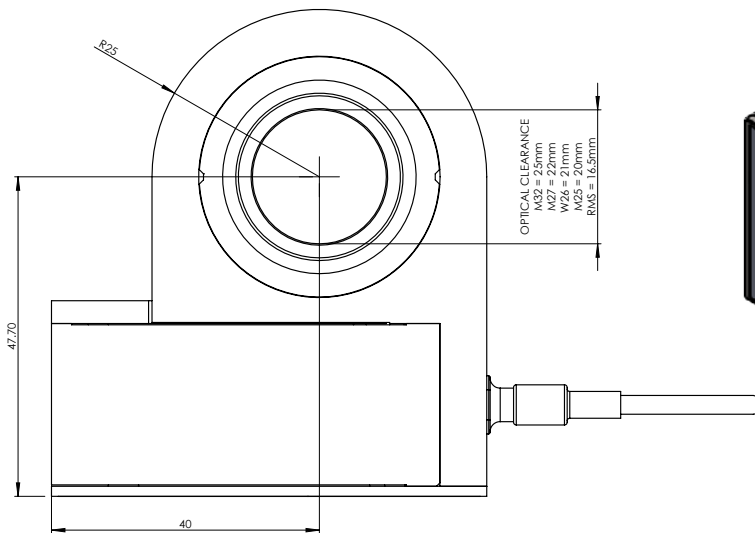
- Analog command input and position output (0-10 V) for compatibility with existing systems.
- Digital commands over USB for maximum accuracy with a DLL interface for customer software. In-position digital outputs can be used to control camera imaging by providing rapid z-stacking.
- Digital quadrature/step-and-direction commands allow high-speed control with a standard 2-wire motion controller interface, without the need for expensive high-precision ADCs/DACs.
- Playback of custom-programmed waveforms such as constant-velocity profiles. Separate digital trigger outputs can be activated at custom-defined points to control external equipment such as camera imaging.
- Compatible with Queensgate Nanobench, Micro-Manager, Metamorph, Elements via RS232C, and other customer software using the DLL interface provided.
- Can be connected to Prior ProScan III for integrated fine z-control.

Step and Settle Time

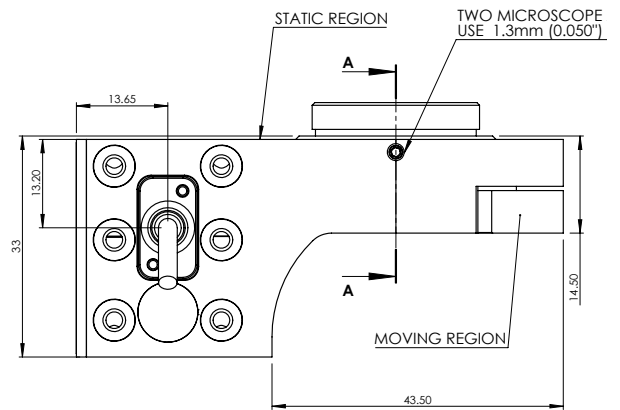
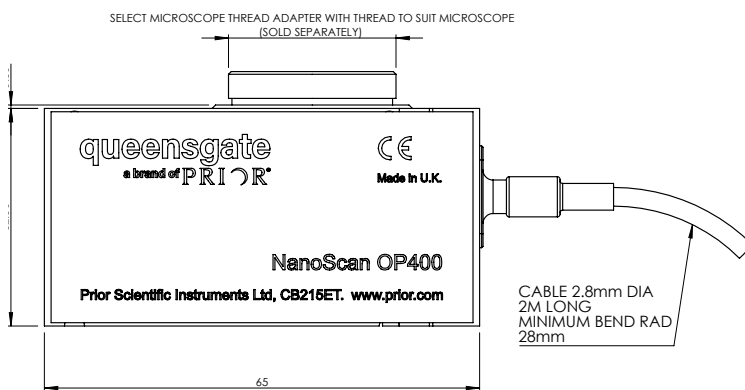
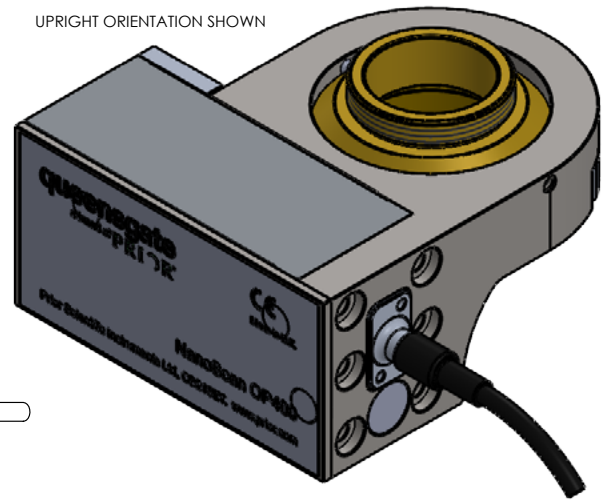


Settling time off the NanoScan OP400 stage with NPC-D-6110 controller with 150g load.

Dimensional Drawings



UPRIGHT ORIENTATION SHOWN



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