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 of the OP400:

- 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

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More to Prior than meets the eye

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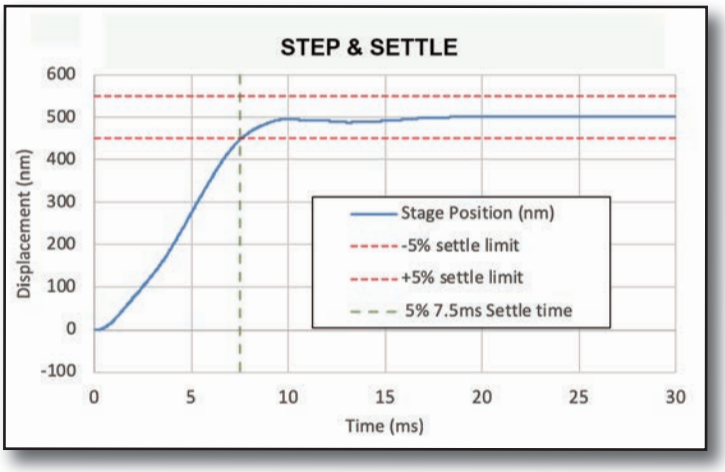
NPC-D-6110 Controller:

- The powerful digital controller drives the OP400 at 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 20µsec update rate
- Fastest recovery time between Z stacks providing enhanced time resolution
- Selectable tuning presets which optimise for step settle, objective mass and resolution.

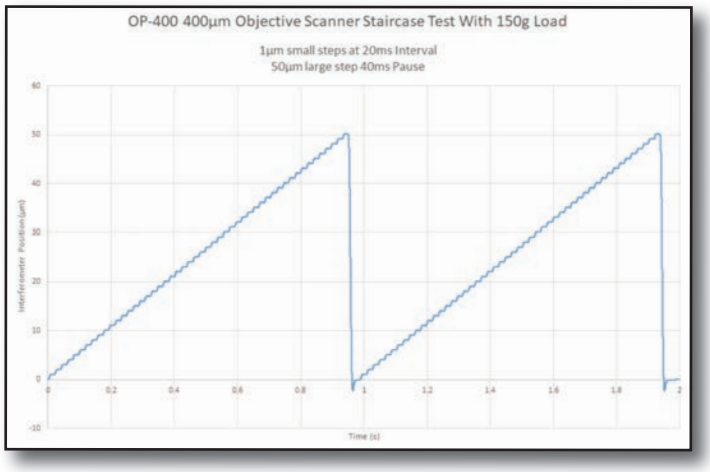
Interfacing:

- Analog command input and position output (0-10V) 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 providing rapid Z stacking.
- Digital quadrature/step-and-direction commands allowing 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 or customer software using DLL interface provided. Can be connected to Prior ProScan™III for integrated fine-Z control.

Step and Settle Time:



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



The NanoScan OP400's unsurpassed speed and settle time minimizes rejected images, reduces drift and allows for higher throughput.

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Specifications for NanoScan OP400 Positioner:

Parameter	Specification
Material	Stainless Steel
Closed Loop Range	400µm
Resolution*	0.7 nm under 150g load
Linearity*	0.005%
Repeatability	1.6 nm Slow PID, 50µm step, 1SD
Max Objective Load	800g
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 12mm with M32

*Typical specification.
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 x 90mm
Weight of Controller Box	3.0 kg
Cooling	Convection cooled - temperature controlled fans
Electrical	
Power input	100 to 240 VAC nominal 47 to 63Hz
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
Environmental - Operational	
Temperature	10 to 40°C
Relative humidity	5 to 80% Relative Humidity

NanoScan OP400 System Ordering Information:

Part Number	Description
QGOP-400-UP-D1	System incorporating NanoScan OP400 (0-500g load) for upright microscopes using objective lenses and NPC-D-6110 controller
QGOP-400-UP-HL-D1	System incorporating NanoScan OP400 (500-1000g load) for upright microscopes using objective lenses and NPC-D-6110 controller
QGOP-400-INV-D1	System incorporating NanoScan OP400 (0-500g load) for inverted microscopes using objective lenses and NPC-D-6110 controller
QGOP-400-INV-HL-D1	System incorporating NanoScan OP400 (500-1000g load) for inverted microscopes using objective lenses and NPC-D-6110 controller

Microscope 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 1/36")
QG-OP-MIC-M27-1	Microscope adapter M27 x 1.0

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")
QG-OP-OBJ-M27-1	Objective adapter M32 x 0.75 to M27 x 1.0

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")

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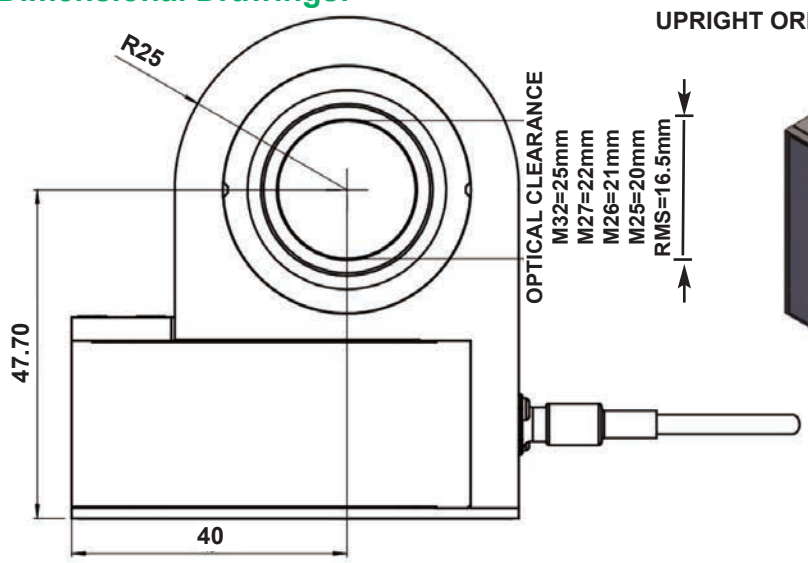
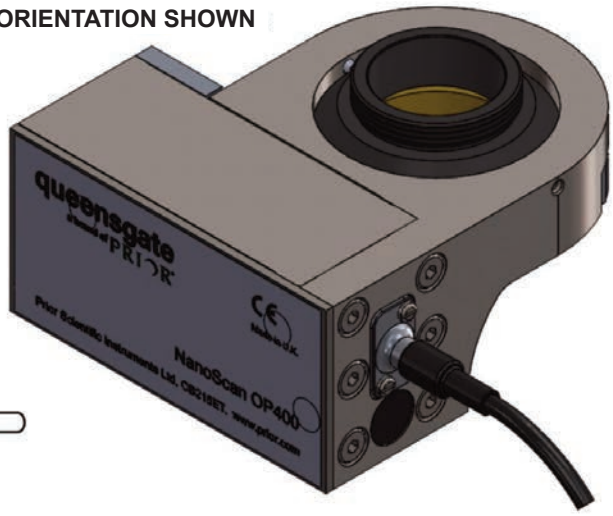
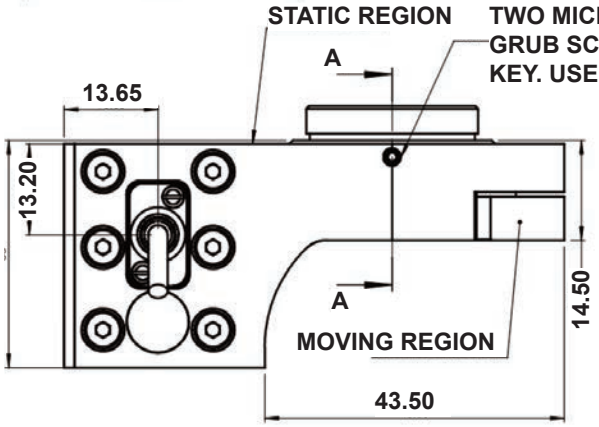
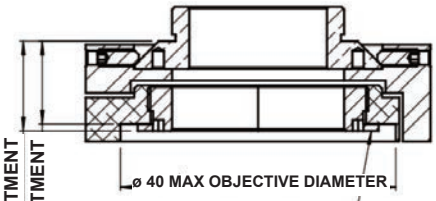
Dimensional Drawings:



UPRIGHT ORIENTATION SHOWN

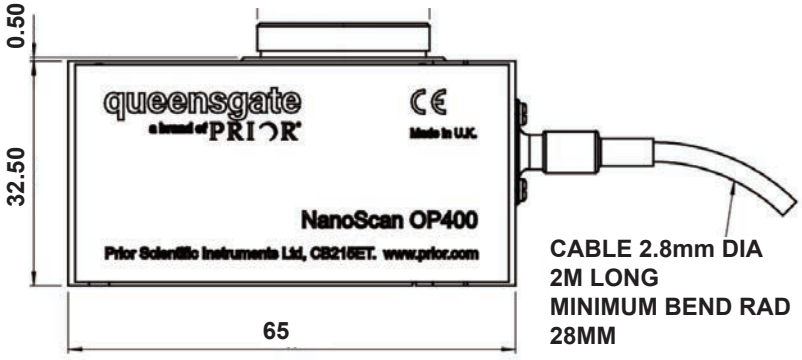






SCREW IN OBJECTIVE THREAD ADAPTER IF NOT USING M32 OBJECTIVES

13 RMS M25. M27 ECT PARAFOCAL ADJUSTMENT
12 M32 ONLY PARAFOCAL ADJUSTMENT



CABLE 2.8mm DIA
2M LONG
MINIMUM BEND RAD
28MM

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