

Automated XYZ Gantry Translation Stage



GTS-Series Gantry Translation Stages offer three precision closed-loop DC servo motor linear actuators available in a range of travels. The standard 15-inch unit, shown, allows 380 mm of travel in the X- and Y-coordinates and 100 mm (4") of travel in the Z-axis, with smaller and larger travel ranges available. An optional fourth axis controls the zooming video microscope, shown, available with zoom ranges as high as 16X.

The units utilize precision bearing guide assemblies to provide smooth and accurate movement. The entire stage assembly is precisely machined to demanding tolerances to provide a standard XY resolution of less than 3 μm , with typical bi-directional repeatability better than 5 μm . The X and Y axes have a maximum travel speed of 100 mm (4") per second in the standard configuration, with other speed options available.

The Z-axis has a standard resolution of less than 0.1 μm , with typical bi-directional repeatability better than 1 μm . The Z-axis has a maximum travel speed of 7 mm (1/4") per second in the standard configuration, with other speed options available.

Linear encoder options are available on all axes to provide resolutions down to 10 nm, with typical repeatability better than 500 nm, and scale accuracy of $\pm 3 \mu\text{m}$ per length of scale.

The GTS can be custom configured with cameras and video microscopes with automated focusing and motorized zoom. A wide array of lighting options is available as well, including coaxial illuminators, ring lights, and the LED light box, shown, with variable intensity and uniform light distribution.

The large number of options available allows the unit to be easily configured for a wide variety of image acquisition, inspection, and 3D positioning and profiling applications.

Features

- Closed-loop DC servo control of the X-, Y-, and Z-axes for precise positioning
- Wide dynamic speed range with adjustable trapezoidal move profiles
- Electronic torque limit on drives for "built-in" limit protection
- Hall-effect limit sensors on X-, Y-, and Z-axes
- Micron-scale repeatability on all axes
- Smooth adjustable dual-range joystick control
- Other functions including programmable positioning patterns and scans

Specifications

| | |
|--|--------------------------------|
| X- and Y-axes range of travel | 380 mm x 380 mm (15" x 15") |
| X- and Y-axes resolution | < 3 μm |
| X- and Y-axes RMS repeatability (typical) | < 5 μm |
| X- and Y-axes maximum velocity | 100 mm/s |
| Z-axis range of travel (typical) | 100 mm (4") |
| Z-axis resolution (encoder step) | 22 nm |
| Z-axis RMS repeatability (typical) | < 700 nm |
| Z-axis maximum velocity | 7 mm/s |

Lead Screw Options

| Lead screw pitch options | Rotary encoder resolution | | Maximum speed (dynamic range = 400) | |
|--------------------------|---------------------------|--------|-------------------------------------|-----------|
| | XY | Z | XY | Z |
| 25.40 mm (Ultra-coarse) | N/A | 88 nm | N/A | 28 mm/s |
| 12.70 mm (Super-coarse) | 1680 nm | 44 nm | 200 mm/s | 14 mm/s |
| 6.35 mm (Standard) | 840 nm | 22 nm | 100 mm/s | 7 mm/s |
| 1.59 mm (Fine) | 210 nm | 5.5 nm | 25 mm/s | 1.75 mm/s |

**Shown with standard 6.35 mm pitch lead screws*

