

High- Precision Linear Positioning Stage

HIGH TRAVEL ACCURACY

L-511

- + Travel ranges to 155 mm (6")
- + Optional linear encoder for direct position measurement
- + Stepper motor
- + Direction- sensing reference point switch



Reference- class linear stage

Recirculating ball bearings for high travel accuracy and load capacity. Precision ball screw with 2 mm pitch. Stress- relieved aluminum base for highest stability. Travel ranges L-511.2 variants: 52 mm (2"), L-511.4: 102 mm (4"), L-511.6: 155 mm (6")

Drive types

.xxSD variant: 2- phase stepper motor for high torque even at low velocities and high resolution. Noncontact limit switches. Noncontact, direction- sensing reference point switch in the middle of the travel range

Position measurement

Integrated linear encoder, centrally installed. Direct position measurement of moved platform without impact on positioning precision due to mechanical play or hysteresis in the drive

Min. incremental motion and slow motion

In conjunction with the SMC Hydra controller, versions with stepper motor and integrated linear encoder (L-511.xASD00) achieve repeatable minimum incremental motion in the range of the sensor resolution. With this configuration, constant, low velocities of a few sensor steps per second can be attained

Fields of application

Precision positioning for science and industry, high duty cycles

Specifications

	L-511.xASD00	L-511.x0SD00	Unit	Tolerance
	Linear stage with stepper motor and linear encoder (direct position measurement)	Linear stage with stepper motor		
Motion and Positioning				
Travel range [#]	52 / 102 / 155	52 / 102 / 155	mm	
Integrated sensor	Linear encoder	–		
Sensor resolution linear encoder	1 ^{###}	–	nm	typ.
Minimum incremental motion	0.02	0.625*	µm	typ.
Unidirectional repeatability	0.1	0.6	µm	typ.
Backlash	0.2	1	µm	typ.
Crosstalk, angular error xry (pitch)	±60	±60	µrad per 100 mm travel range	typ.
Crosstalk, angular error xrz (yaw)	±40	±40	µrad per 100 mm travel range	typ.
Max. velocity	45	45	mm/ s	

Min. velocity	0.05	–	mm/ s	
Mechanical Properties				
Thread/ spindle pitch	2	2	mm	
Gear ratio	–	–		
Load capacity	100	100	N	max.
Push / pull force	80	80	N	max.
Permissible lateral force	50	50	N	max.
Holding force	40	40	N	max.
Drive Properties				
Motor type	2- phase stepper motor	2- phase stepper motor		
Operating voltage	24	24	V	
Motor power	10	10	W	nominal
Reference point and limit switches	Optical	Optical		
Miscellaneous				
Operating temperature range	0 to 55	-20 to 65	°C	
Material	Aluminum, steel	Aluminum, steel		
Mass	2.5 / 2.9 / 3.3	2.5 / 2.9 / 3.3	kg	±5 %
Connector	HD Sub- D 26- pin (motor), Sub- D 9- pin (linear encoder), incl. 3 m cable set	HD Sub- D 26- pin (motor) to Sub- D 15- pin, incl. 3 m cable		
Recommended controller/ driver	SMC Hydra motion controller (double- axis)	C-663 (single- axis)		

Ask about custom designs!

All cables required for operation with the recommended controller are included in the scope of delivery.

Travel ranges of the variants: L-511.2: 52 mm (2"), L-511.4: 102 mm (4"), L-511.6: 155 mm (6").

Sin/ cos analog signals with 1 V_{pp}, operation with SMC Hydra controller with maximum interpolation.

* 200 full steps/ rev. Motor resolution with C-663 stepper motor controller.

Order Information

L-511.20SD00

Precision Linear Stage, 110 mm Wide, 2- Phase Stepper Motor, 52 mm (2") Travel Range, Optical Limit Switches

L-511.40SD00

Precision Linear Stage, 110 mm Wide, 2- Phase Stepper Motor, 102 mm (4") Travel Range, Optical Limit Switches

L-511.60SD00

Precision Linear Stage, 110 mm Width, 2- Phase Stepper Motor, 155 mm (6") Travel Range, Optical Limit Switches

Stages with direct position measurement

L-511.2ASD00

Precision Linear Stage, 110 mm Wide, 2- Phase Stepper Motor, 52 mm (2") Travel Range, Linear Encoder with Sin/ Cos Signal Transmission, Optical Limit Switches

L-511.4ASD00

Precision Linear Stage, 110 mm Wide, 2- Phase Stepper Motor, 102 mm (4") Travel Range, Linear Encoder with Sin/ Cos Signal Transmission, Optical Limit Switches

L-511.6ASD00

Precision Linear Stage, 110 mm Wide, 2- Phase Stepper Motor, 155 mm (6") Travel Range, Linear Encoder with Sin/ Cos Signal Transmission, Optical Limit Switches

Ask about custom designs!

Controllers / Drivers / Amplifiers

[C-863 Mercury Servo Controller](#)

[SMC hydra SMC- series](#)

[C-663 Mercury Step Controller](#)

[SMC pollux SMC- series](#)

Related Products

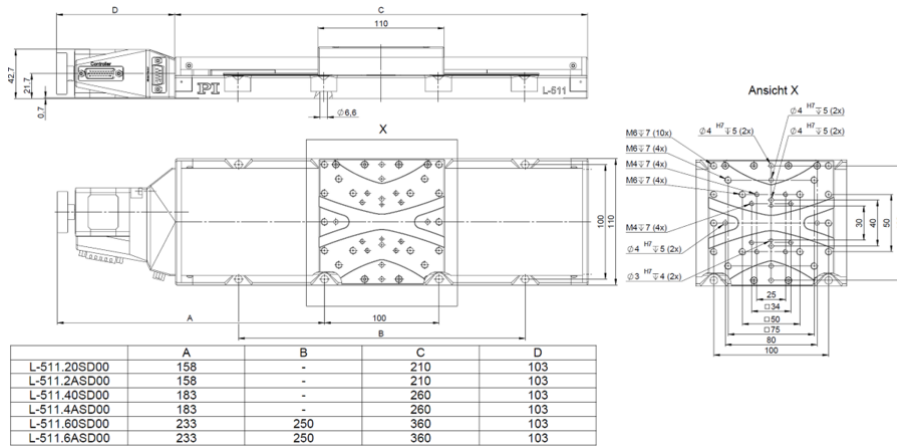
[M-511 • M-521 • M-531 High- Precision Linear Translation Stage](#)

[M-414 High- Load Precision Stage](#)

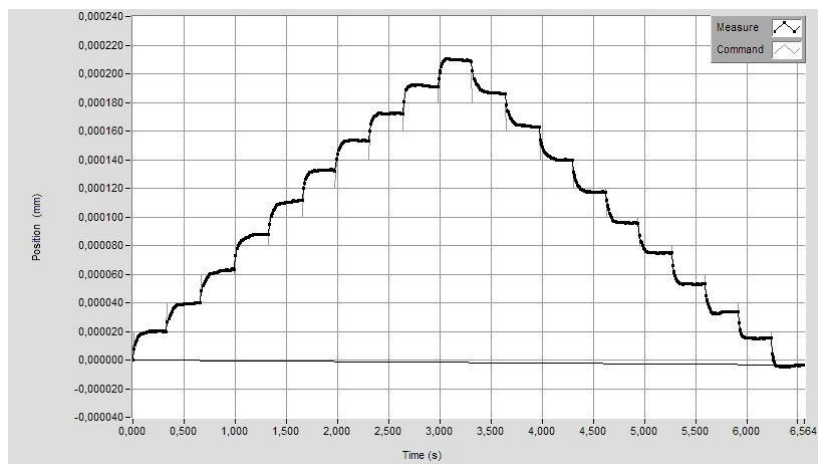
[M-413 High- Load Precision Stage](#)

[HPS-170 High Precision Stage](#)

Drawings / Images



L-511, dimensions in mm



Reliable and repeatable 20 nm-steps performed by L-511 with linear encoder and SMC Hydra controller