

X-LRM-DE Series Datasheet



- * Hardened steel construction and recirculating ball bearing guide provide exceptional stiffness and thermal stability
- * 100, 150, 200 mm travel
- * Integrated linear encoders with 50 nm resolution provide slip/stall detection and position correction
- * 15 μm accuracy over 200 mm
- * 50 kg load capacity
- * Built-in controller, daisy chains with other Zaber products

Zaber's X-LRM-DE series products are motorized linear stages with integrated controllers. An integrated linear encoder combined with stage calibration provides high accuracy positioning over the full travel of the device. The X-LRM-DE's hardened steel construction and recirculating ball bearing guide provide exceptional rigidity and thermal stability. High stiffness makes this stage ideal for multi-axis configurations or applications where excellent stability under cantilever loads is required.

They are stand-alone units requiring only a standard 24-48 V power supply. A knob at the end of the unit permits manual control - press and hold to switch between velocity mode and position mode, turn to move the stage, and press to stop.

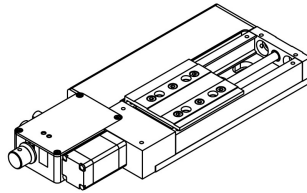
The stages connect to the USB 2.0 or RS-232 port of any computer and can be chained with several units

per chain. They can be chained with any other Zaber products. Convenient locking, 4-pin, M8 connectors on the unit allow for easy and secure connection between products. The chain also shares power, so multiple X-Series products can use a single power supply.

Drawings

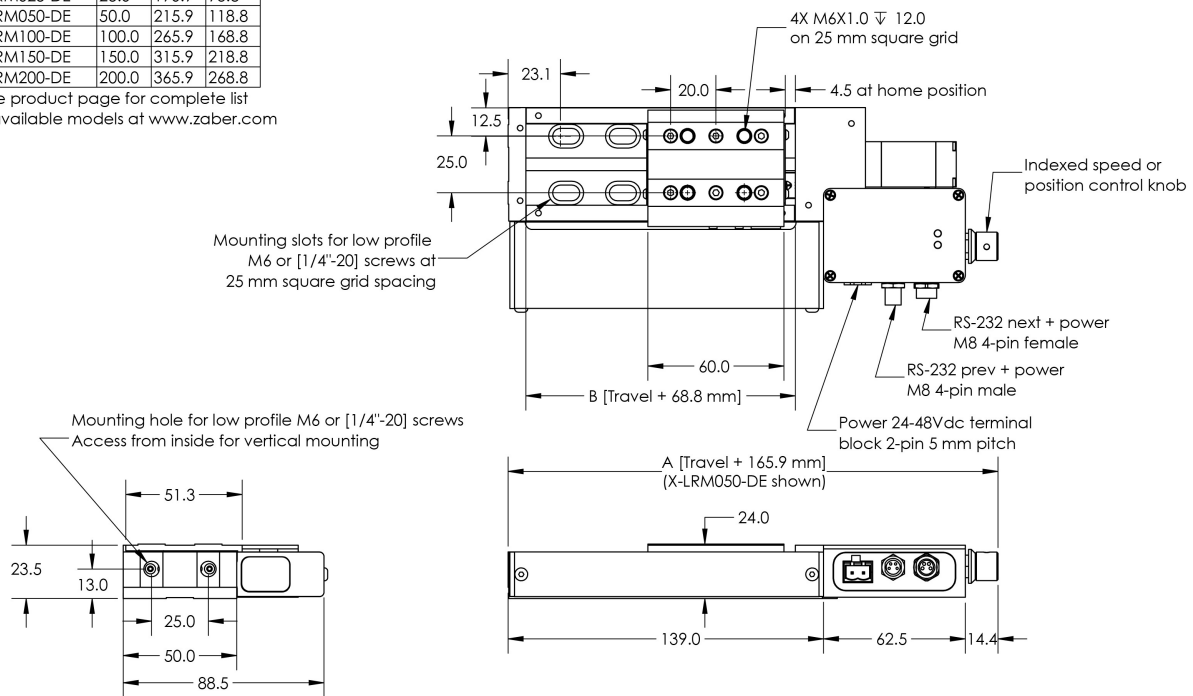
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X-LRM-DE Motorized Linear Stage
dimensions in mm



Model Number*	Travel	A	B
X-LRM025-DE	25.0	190.9	93.8
X-LRM050-DE	50.0	215.9	118.8
X-LRM100-DE	100.0	265.9	168.8
X-LRM150-DE	150.0	315.9	218.8
X-LRM200-DE	200.0	365.9	268.8

*See product page for complete list of available models at www.zaber.com



Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
Accuracy (unidirectional)	15 μ m	0.000591 "
Repeatability	< 4 μ m	< 0.000157 "
Backlash	< 5 μ m	< 0.000197 "
Encoder Type	Linear quadrature encoder	
Peak Thrust	50 N	11.2 lb
Maximum Continuous Thrust	25 N	5.6 lb

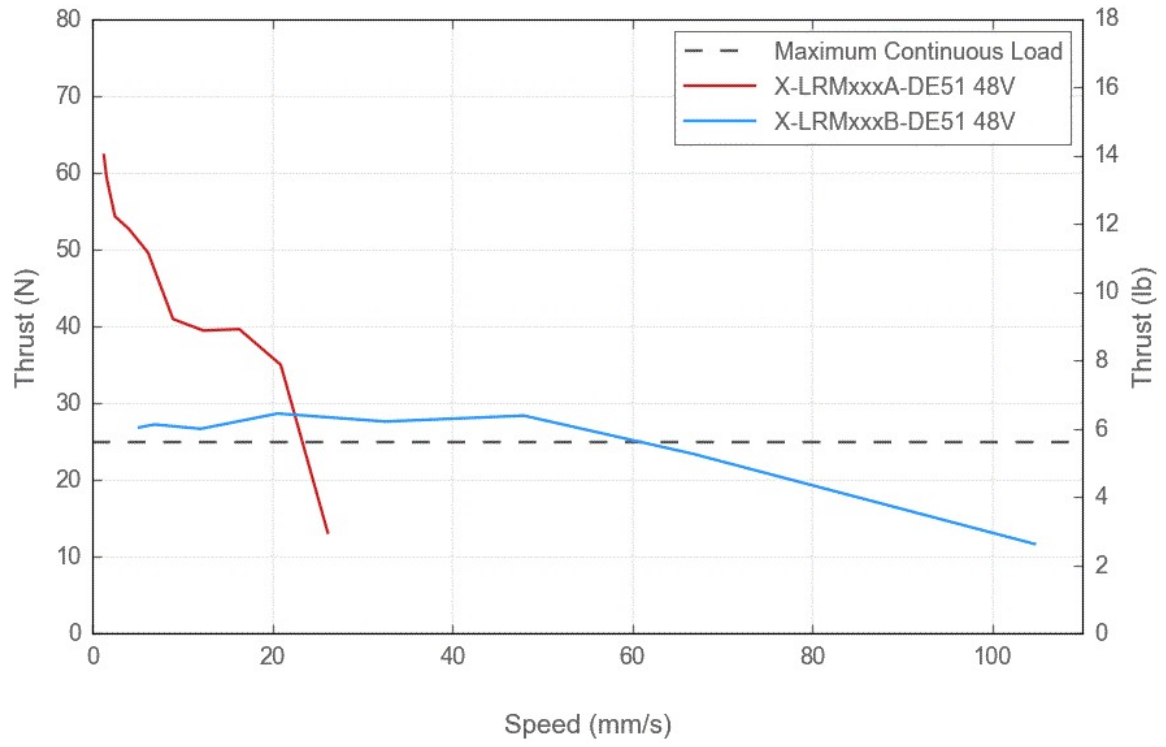
Specification	Value	Alternate Unit
Communication Interface	RS-232, USB 2.0	
Communication Protocol	Zaber ASCII (Default), Zaber Binary	
Maximum Centered Load	500 N	112.1 lb
Maximum Cantilever Load	1500 N-cm	2124.2 oz-in
Guide Type	Recirculating ball bearing	
Vertical Runout	< 8 μm	< 0.000315 "
Horizontal Runout	< 12 μm	< 0.000472 "
Pitch	0.02 °	0.349 mrad
Stiffness in Pitch	750 N-m/°	23 $\mu\text{rad/N-m}$
Roll	0.02 °	0.349 mrad
Stiffness in Roll	550 N-m/°	32 $\mu\text{rad/N-m}$
Yaw	0.02 °	0.349 mrad
Stiffness in Yaw	400 N-m/°	44 $\mu\text{rad/N-m}$
Maximum Current Draw	350 mA	
Power Supply	24-48 VDC	
Power Plug	2-pin Screw Terminal	
Motor Steps Per Rev	200	
Motor Type	Stepper (2 phase)	
Motor Rated Current	600 mA/phase	
Inductance	3.5 mH/phase	
Default Resolution	1/64 of a step	
Data Cable Connection	Locking 4-pin M8	
Mechanical Drive System	Precision lead screw	
Limit or Home Sensing	Magnetic hall sensor	
Manual Control	Yes	
Axes of Motion	1	
Mounting Interface	M3 and M6 threaded holes	
Vacuum Compatible	No	
Operating Temperature Range	0 to 50 °C	
Stage Parallelism	< 10 μm	< 0.000394 "
RoHS Compliant	Yes	
CE Compliant	Yes	

Part Number	Microstep Size (Default Resolution)	Travel Range	Maximum Speed	Minimum Speed
X-LRM100A-DE51	0.047625 μm	100 mm (3.937 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM100B-DE51	0.1905 μm	100 mm (3.937 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM150A-DE51	0.047625 μm	150 mm (5.905 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM150B-DE51	0.1905 μm	150 mm (5.905 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM200A-DE51	0.047625 μm	200 mm (7.874 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM200B-DE51	0.1905 μm	200 mm (7.874 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)

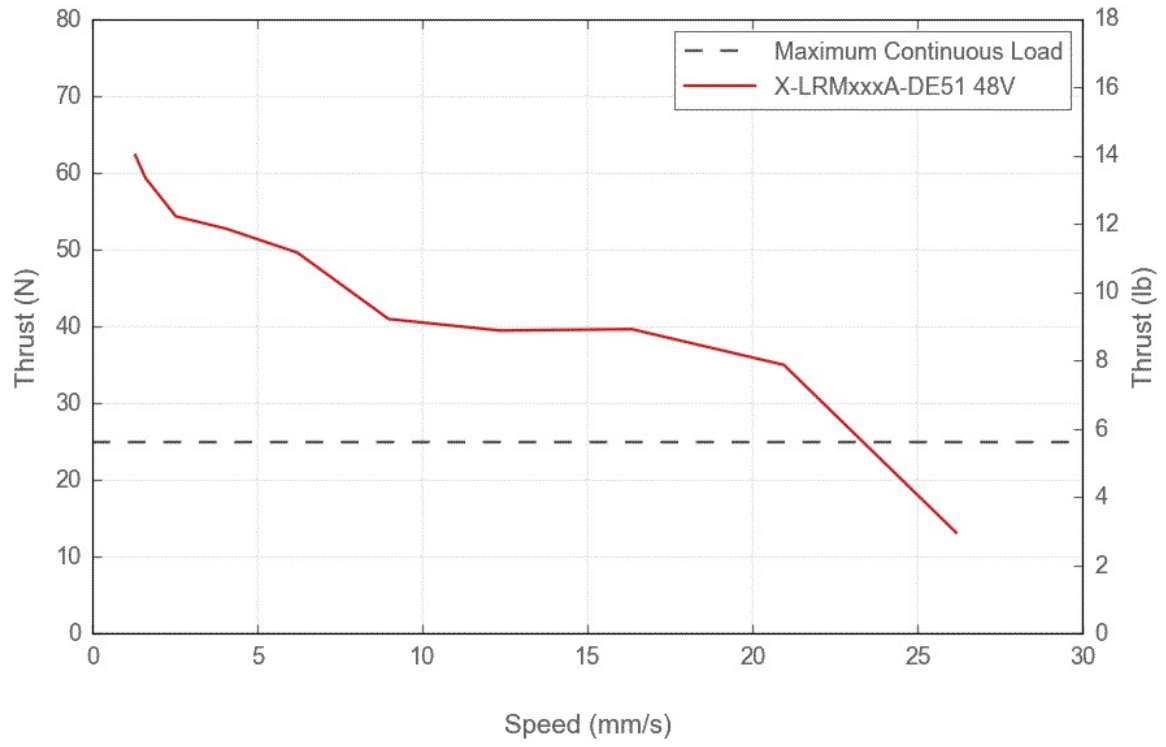
Part Number	Speed Resolution	Linear Motion Per Motor Rev	Weight
X-LRM100A-DE51	0.000029 mm/s (0.000001 "/s)	0.6096 mm (0.024 ")	1.14 kg (2.513 lb)
X-LRM100B-DE51	0.000116 mm/s (0.000005 "/s)	2.4384 mm (0.096 ")	1.14 kg (2.513 lb)
X-LRM150A-DE51	0.000029 mm/s (0.000001 "/s)	0.6096 mm (0.024 ")	1.32 kg (2.910 lb)
X-LRM150B-DE51	0.000116 mm/s (0.000005 "/s)	2.4384 mm (0.096 ")	1.32 kg (2.910 lb)
X-LRM200A-DE51	0.000029 mm/s (0.000001 "/s)	0.6096 mm (0.024 ")	1.50 kg (3.307 lb)
X-LRM200B-DE51	0.000116 mm/s (0.000005 "/s)	2.4384 mm (0.096 ")	1.50 kg (3.307 lb)

Charts

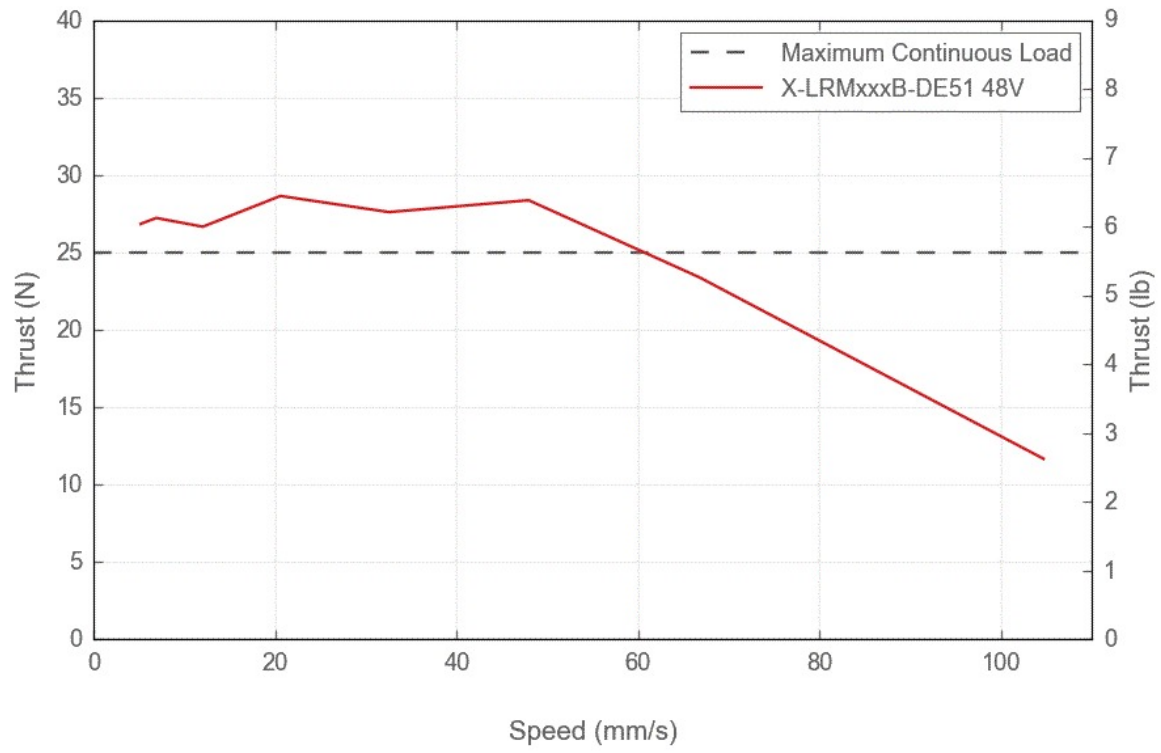
Thrust Speed Performance



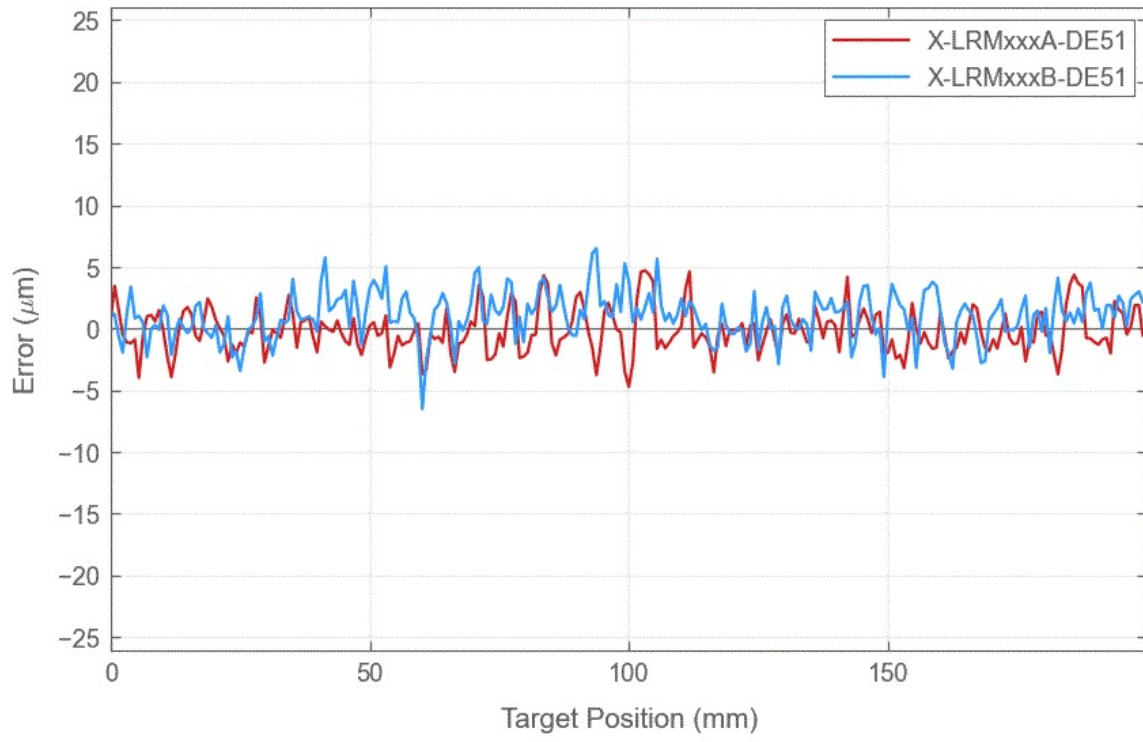
Thrust Speed Performance



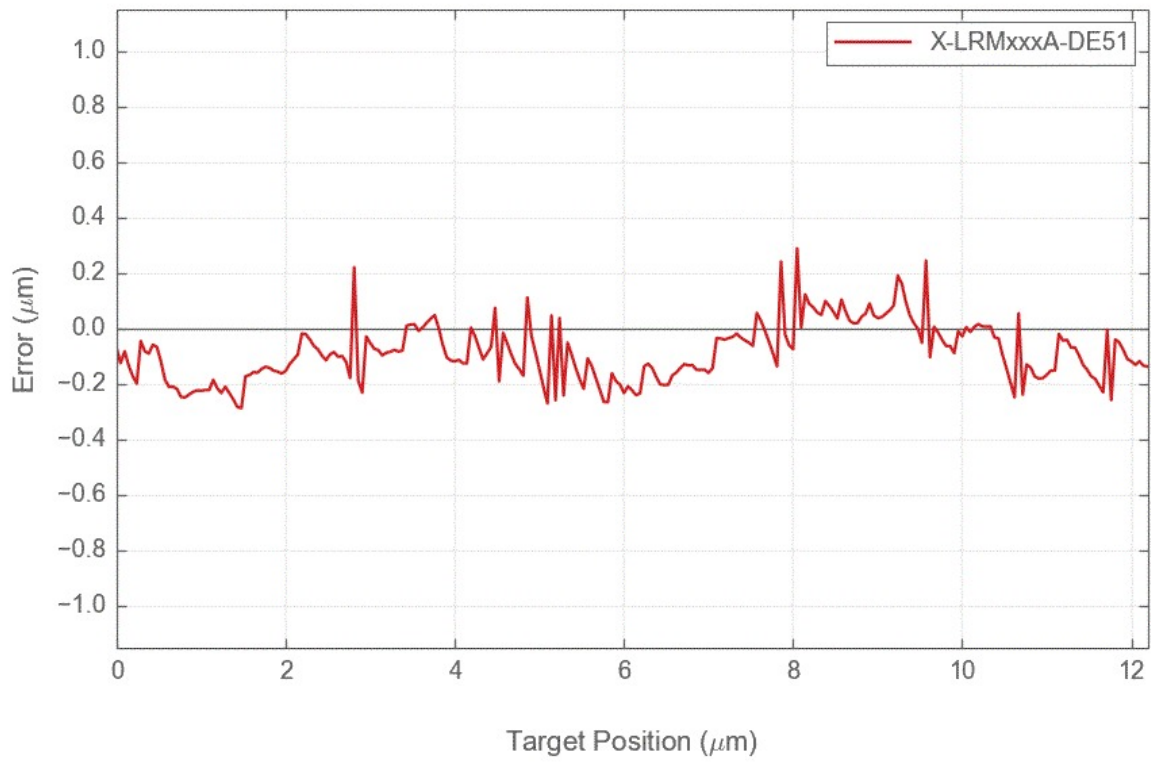
Thrust Speed Performance



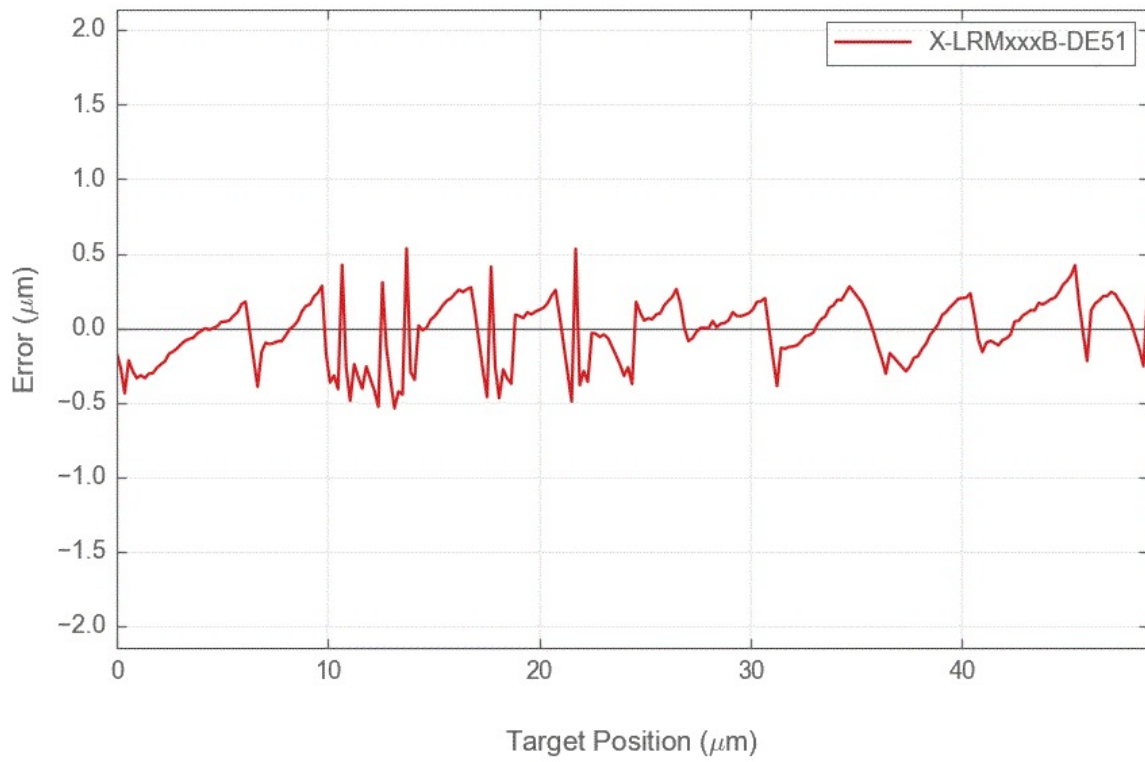
Typical Accuracy



Typical Microstepping Accuracy



Typical Microstepping Accuracy



LRM Linear Bearing Lifetime

