

## X-LRM-DE Series Datasheet



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

### X-LRM-DE Series Overview

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.

*For more information visit: <https://www.zaber.com/products/linear-stages/X-LRM-DE>*

## X-LRM-DE Series Part Numbering

## X-LRM-DE Series Drawings

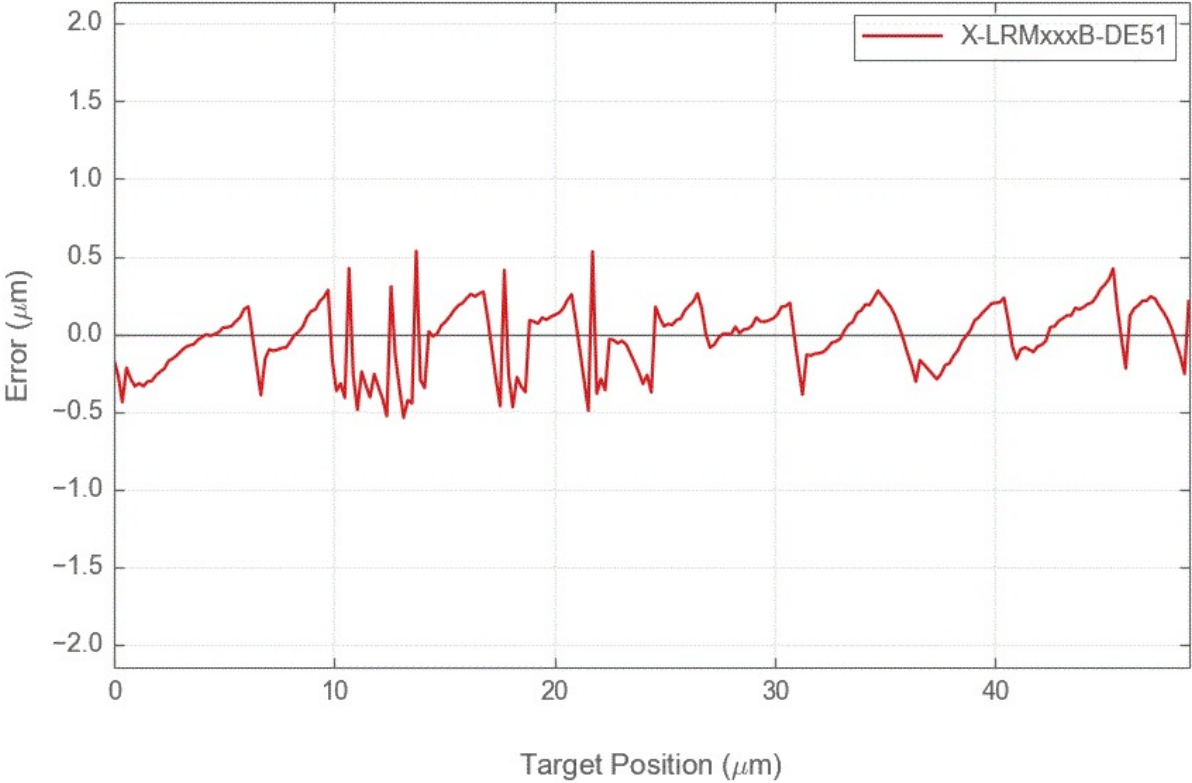
## X-LRM-DE Series Specifications

Specification	Value	Alternate Unit
Microstep Size (Default Resolution)	0.047625 $\mu\text{m}$	
Built-in Controller	Yes	
Travel Range	200 mm	7.874"
Accuracy (unidirectional)	15 $\mu\text{m}$	0.000591"
Repeatability	< 2.5 $\mu\text{m}$	< 0.000098"
Backlash	< 5 $\mu\text{m}$	< 0.000197"
Maximum Speed	25 mm/s	0.984"/s
Minimum Speed	0.000029 mm/s	0.000001"/s
Speed Resolution	0.000029 mm/s	0.000001"/s
Encoder Type	Linear quadrature encoder	
Peak Thrust	50 N	11.2 lb
Maximum Continuous Thrust	25 N	5.6 lb
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 $\mu\text{m}$	< 0.000315"
Horizontal Runout	< 12 $\mu\text{m}$	< 0.000472"
Pitch	0.02°	0.349 mrad
Roll	0.02°	0.349 mrad
Yaw	0.02°	0.349 mrad
Stiffness in Pitch	750 N-m/°	23 $\mu\text{rad/N-m}$
Stiffness in Roll	550 N-m/°	32 $\mu\text{rad/N-m}$
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	
Linear Motion Per Motor Rev	0.6096 mm	0.024"
Motor Steps Per Rev	200	

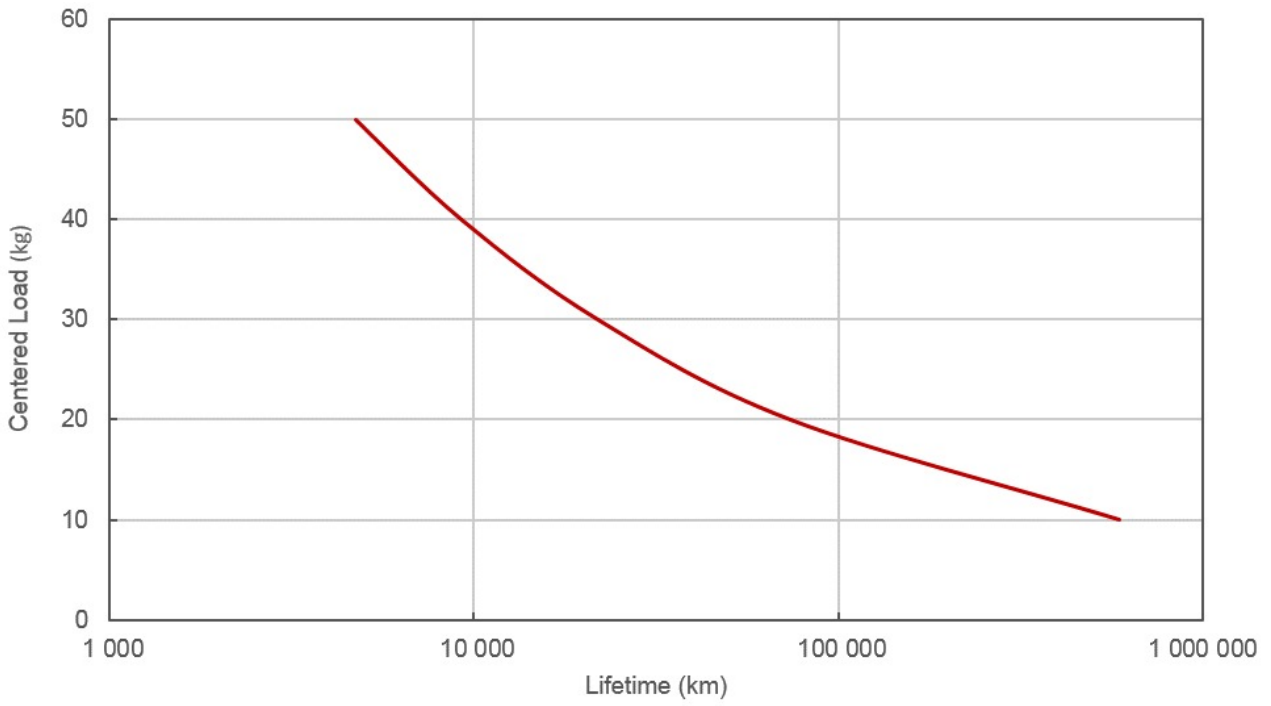
Specification	Value	Alternate Unit
Motor Type	Stepper (2 phase)	
Motor Rated Current	600 mA/phase	
Inductance	3.5 mH/phase	
Default Resolution	1/64 of a step	
Data Cable Connection	Locking 4-pin M8	
Mechanical Drive System	Precision lead screw	
Limit or Home Sensing	Magnetic hall sensor	
Manual Control	Yes	
Axes of Motion	1	
Mounting Interface	M3 and M6 threaded holes	
Operating Temperature Range	0 to 50 °C	
Vacuum Compatible	No	
RoHS Compliant	Yes	
Stage Parallelism	< 10 µm	< 0.000394"
CE Compliant	Yes	
Weight	1.50 kg	3.307 lb

X-LRM-DE Series Charts

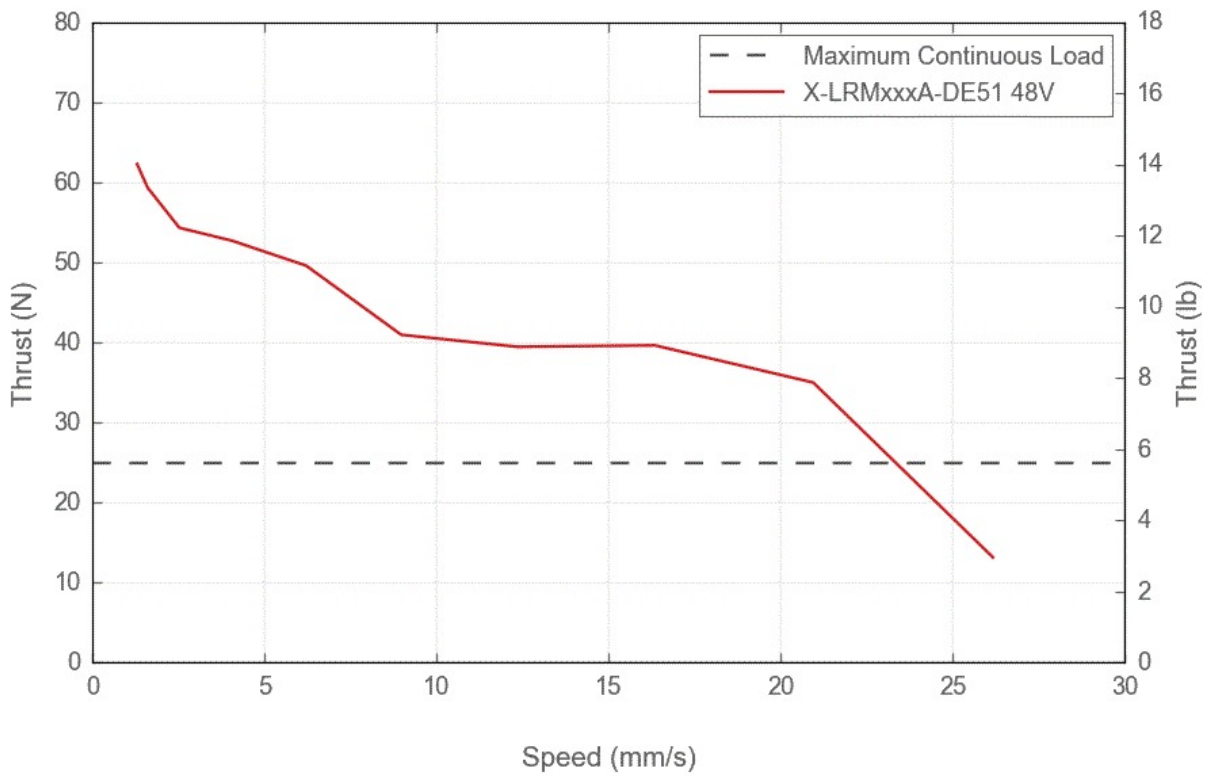
Typical Microstepping Accuracy



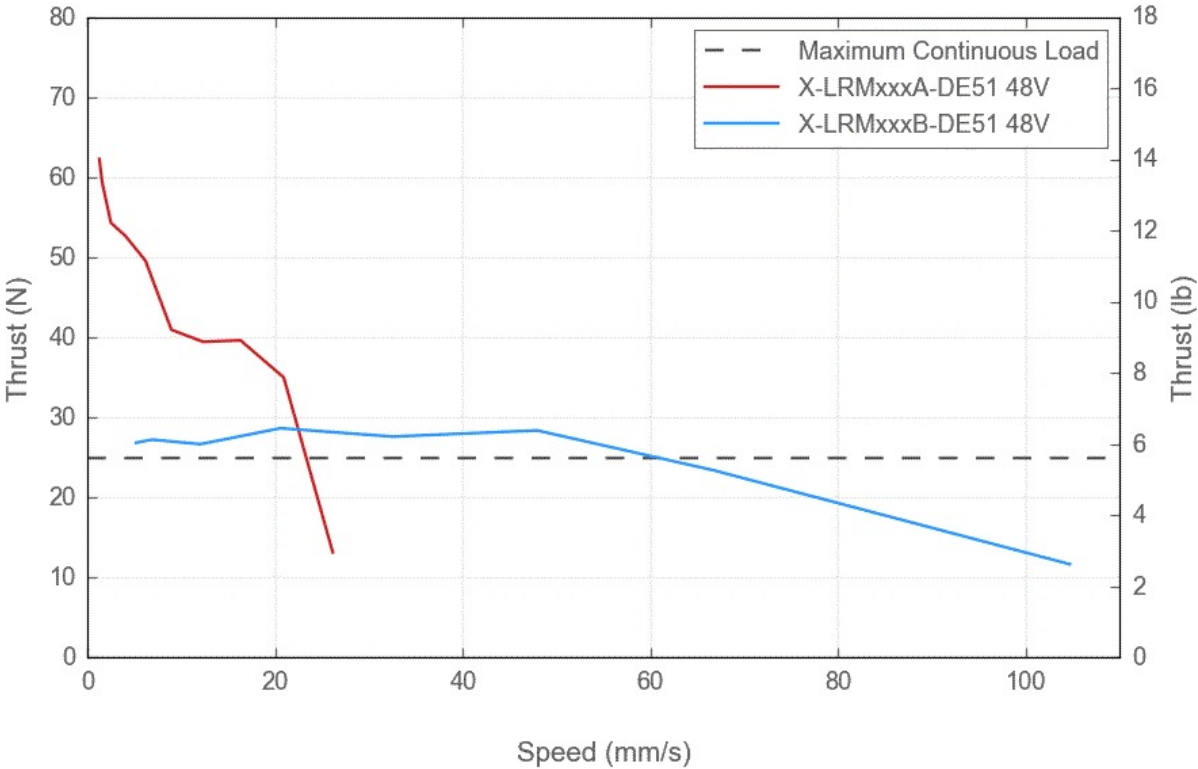
### LRM Linear Bearing Lifetime



### Thrust Speed Performance

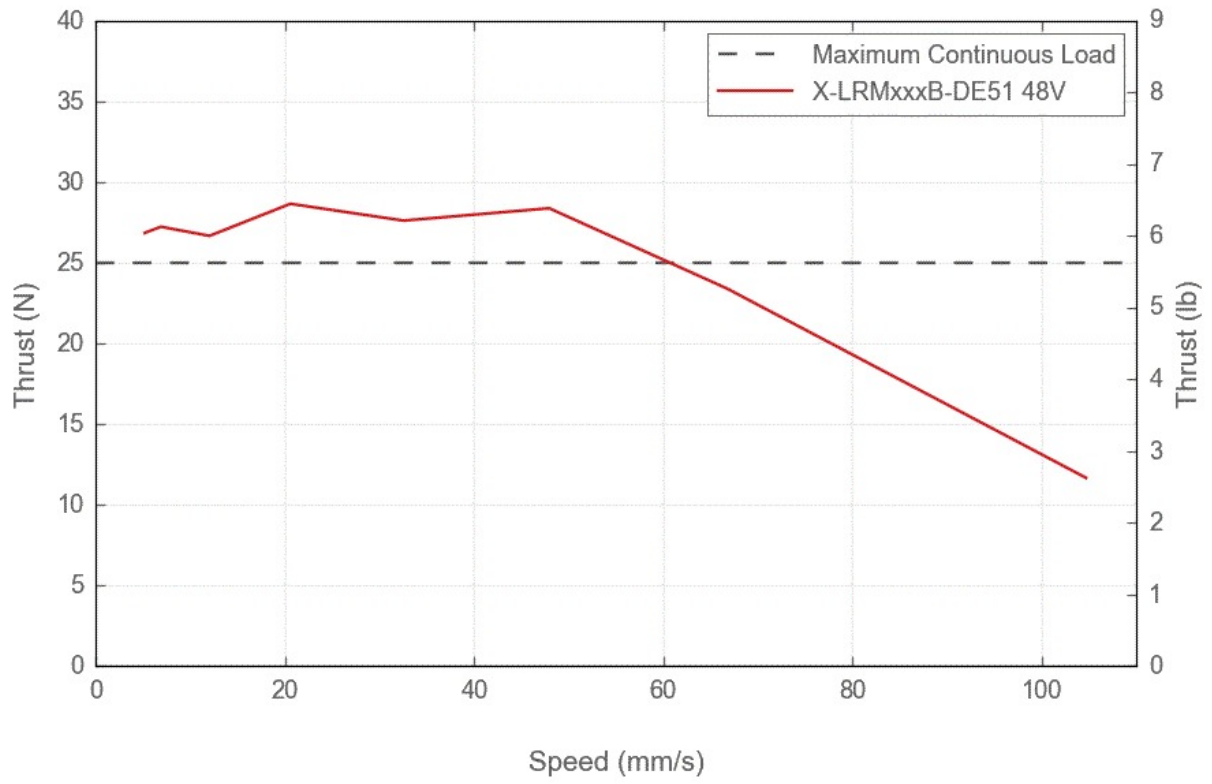


# Thrust Speed Performance

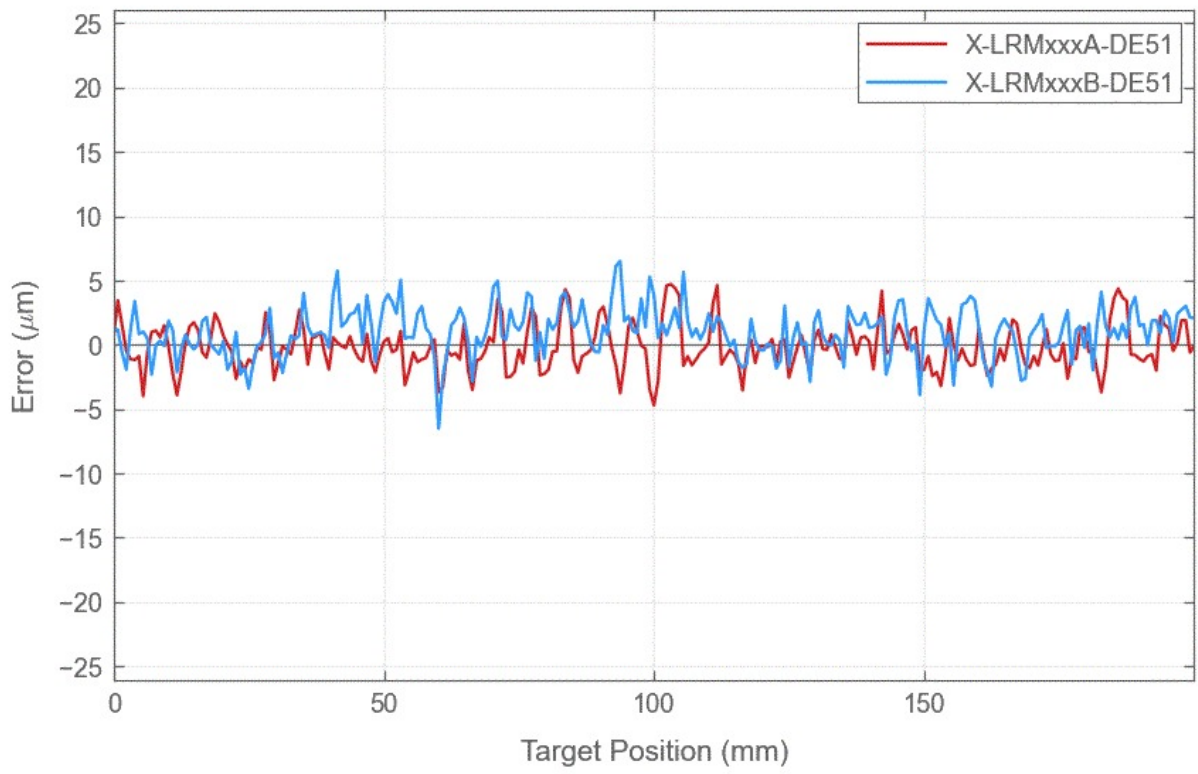




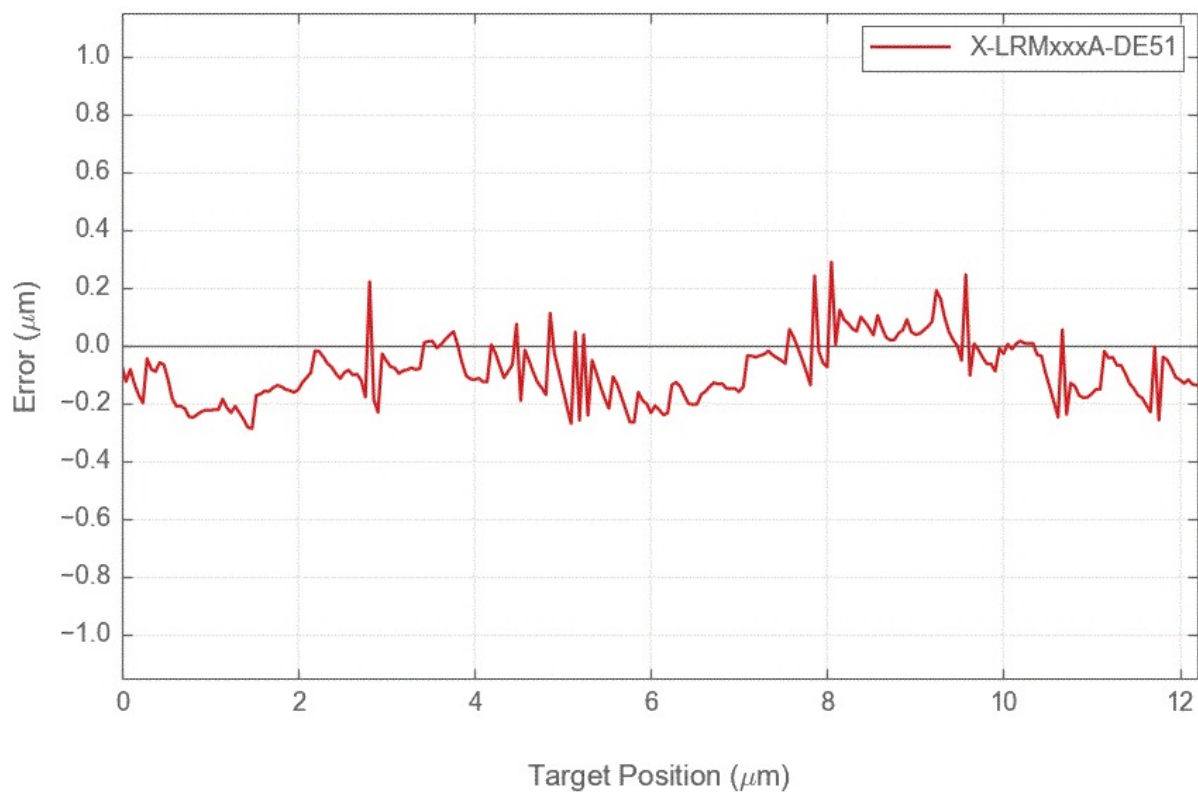
## Thrust Speed Performance



### Typical Accuracy



## Typical Microstepping Accuracy



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