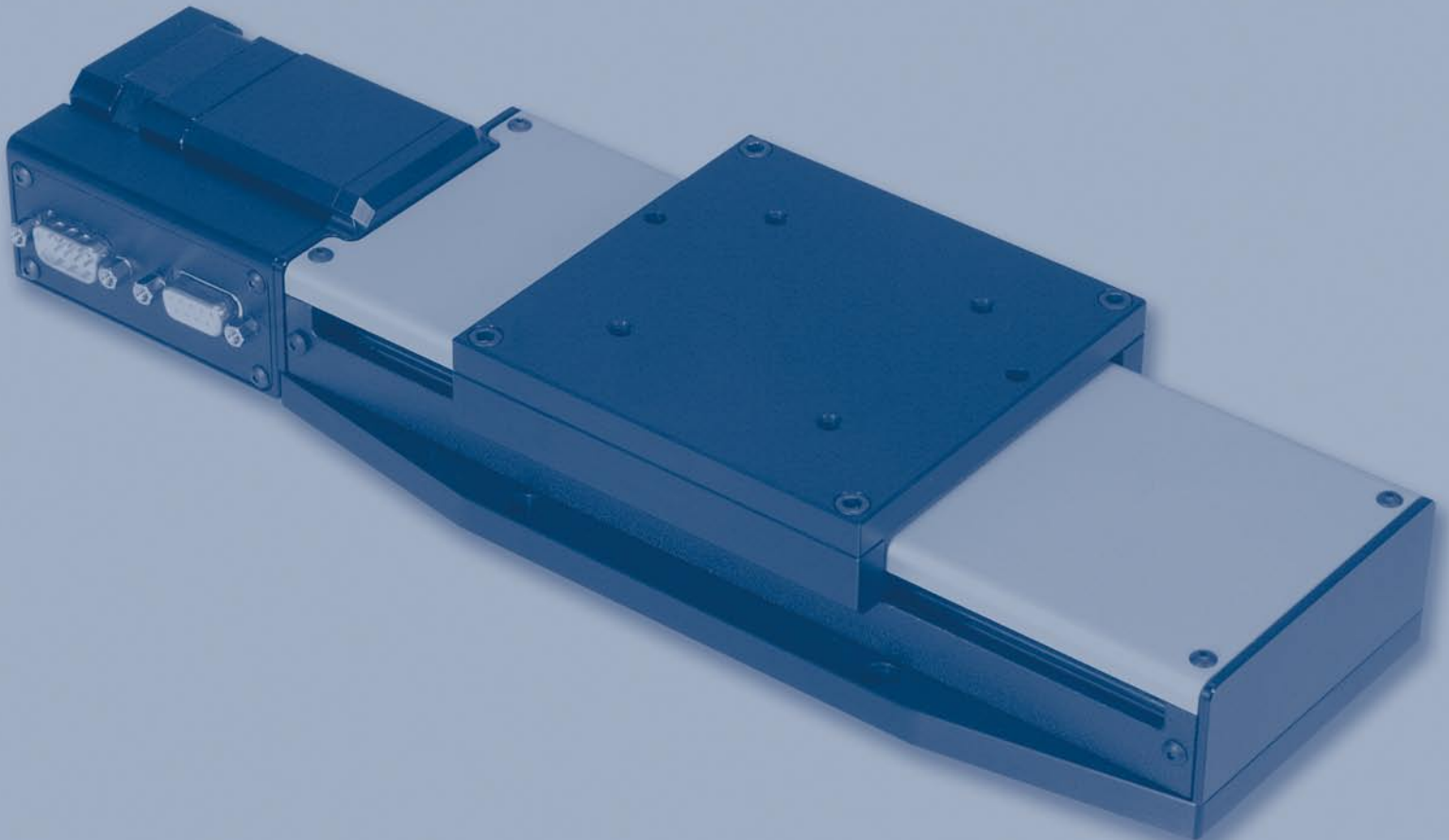


# LINEAR POSITIONERS

NLS4 SERIES LINEAR STAGE



# NLS4 Series Design

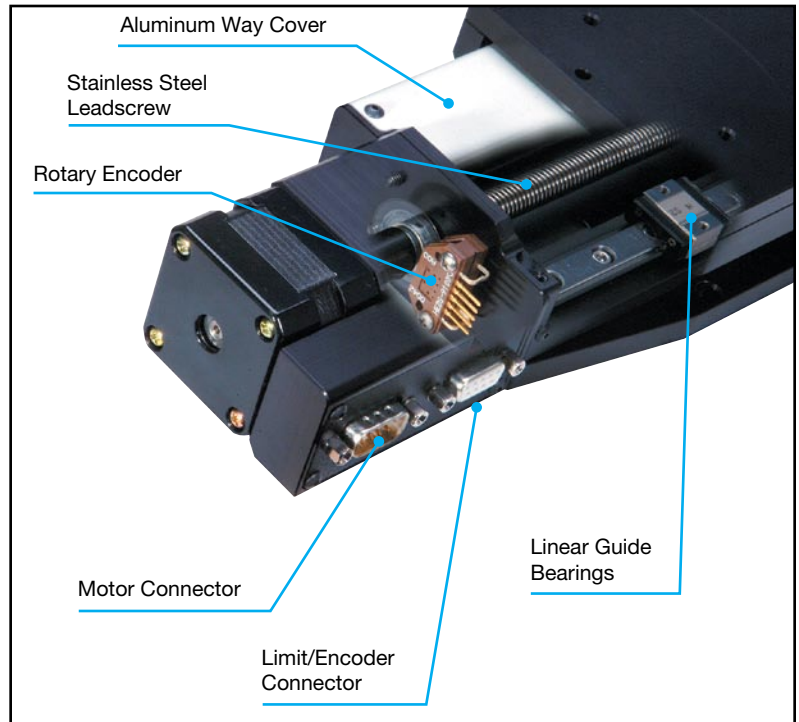
Newmark's NLS4 series linear stages offer high resolution and repeatability in a small footprint.

NLS4 stages are designed for a variety of applications in research and other industrial areas requiring precision positioning such as in semiconductor processing, fiber optics manufacturing and biotech automation.

The design of the NLS4 series stages was optimized for maximum stability and performance with the use of FEA analysis and incorporates the best in materials and component selection.

For more reliability and durability, the ways and leadscrews are protected with a strong machined cover and the encoder is mounted internally directly to the leadscrew rather than being exposed to shock and contamination when mounted in the rear of the motor.

All NLS4 series stages are machined from 6061 aluminum alloy to provide a light yet stiff and stable stage.

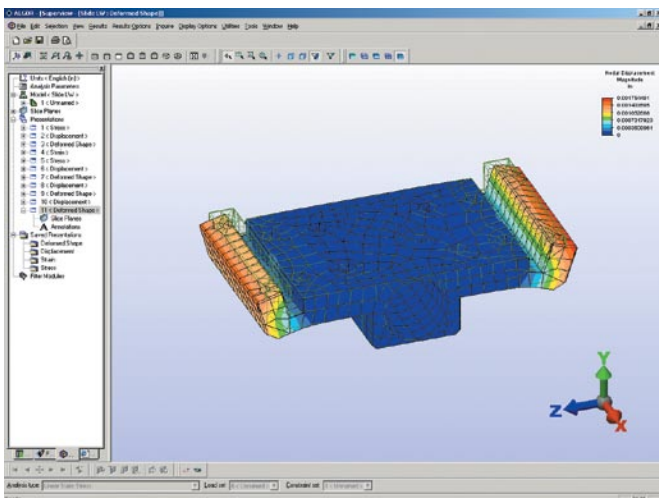


The drive system utilizes a stainless steel ACME leadscrew with internally lubricated plastic drive nut. The drive nut offers zero backlash operation that automatically adjusts for wear to insure zero backlash for the life of the stage.

The use linear guide bearings provide a smooth motion with high load capacity and stiffness. Since the carriage is supported over the entire travel of the stage, a good cantilevered load capacity can be achieved.

Separate connectors for motor power and limit/encoder signals are provided for ease of operation. Integrated limit switches and a high torque size 17 stepper motor are supplied as standard items.

***FEA Software used to aid in the design of the NLS4 stages.***



# NLS4 Series Ordering Information

**EXAMPLE PART NUMBER: NLS4-2.5-16-E**

## **NLS4 SERIES LINEAR STAGE**

NLS4-2.5	2.5 inch travel with integrated limit switches
NLS4-4	4 inch travel with integrated limit switches
NLS4-6	6 inch travel with integrated limit switches
NLS4-8	8 inch travel with integrated limit switches
NLS4-10	10 inch travel with integrated limit switches
NLS4-12	12 inch travel with integrated limit switches

## **LEADSCREW**

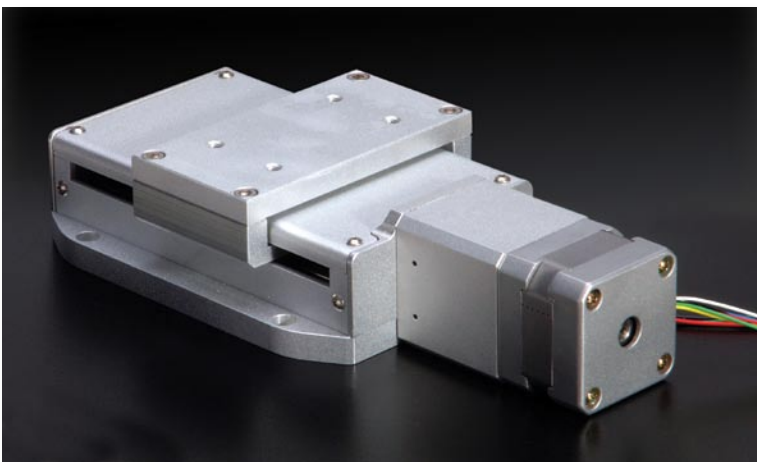
-16	0.062 in/rev acme leadscrew with anti-backlash nut
-25	0.25 in/rev acme leadscrew with anti-backlash nut

*Note: Additional leadscrew pitches are available, please consult factory.*

## **ENCODER**

-E1	1000 lines/rev 2 channel quadrature TTL square wave outputs with index (3rd channel)
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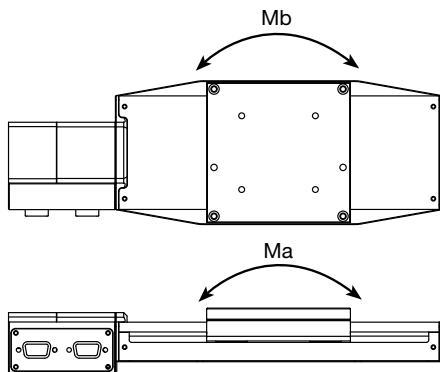
**Vacuum compatible versions are available.**



- Operation down to  $10^{-6}$  Torr
- Teflon jacketed wires
- Fluxless soldered connections
- Vacuum compatible motor and limit switches
- Low vapor pressure lubricant
- Blind holes are vented
- All parts undergo a thorough cleaning process, followed by latex-gloved assembly.

# NLS4 Series Specifications

Specifications		
Travel	2.5 inches, 4 inches, 6 inches, 8 inches, 10 inches, 12 inches	
Resolution	0.062 in/rev lead	0.03 $\mu\text{m}$ @ 50,000 steps/rev motor resolution
	0.250 in/rev lead	0.13 $\mu\text{m}$ @ 50,000 steps/rev motor resolution
	0.062 in/rev lead with Encoder	0.4 $\mu\text{m}$ @ 4,000 counts/rev encoder resolution (-E1 option)
	0.250 in/rev lead with Encoder	1.6 $\mu\text{m}$ @ 4,000 counts/rev encoder resolution (-E1 option)
Maximum Travel Speed	0.062 in/rev lead	0.5 inches/second
	0.250 in/rev lead	2 inches/second
Maximum Load	Horizontal	50 lbs
	Vertical	15 lbs
	Side	40 lbs
Repeatability Bidirectional	5.0 $\mu\text{m}$	
Stage Weight	NLS4-2.5 = 3.2 lbs   NLS4-4 = 4.7 lbs   NLS4-6 = 5.3 lbs NLS4-8 = 5.7 lbs   NLS4-10 = 6.3 lbs   NLS4-12 = 6.9 lbs	
Material	Aluminum	
Finish	Black Anodize	



## Load Characteristics

Travel	2.5 in	4 in	6 in	8 in
Ma	9 ft•lb	15 ft•lb		
Mb	9 ft•lb	14 ft•lb		
Mc	15 ft•lb			

## Motor Connection

DB-9 Male	Description
1	Phase A
2	Phase A'
3	Phase B
4	Phase B'
5	A Center Tap
6	B Center Tap
7	NC
8	NC
9	NC

## Signal Connection

DB-9 Female	Description
1	Positive Limit
2	Negative Limit
3	Gnd
4	NC
5	NC
6	NC
7	NC
8	NC
9	NC

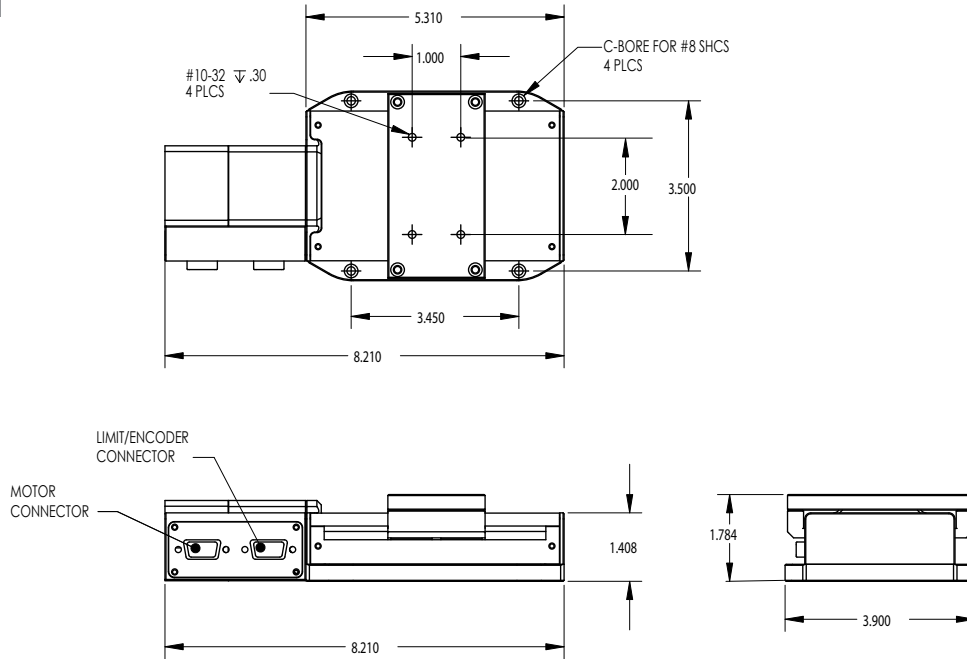
## Signal Connection (Encoder Option)

HD-15 Female	Description
1	Positive Limit Switch
2	Negative Limit Switch
3	Gnd (Limits)
4	Gnd (Encoder)
5	+5V
6	Ch. A
7	Ch. A-
8	Ch. B
9	Ch. B-
10	Index
11	Index-

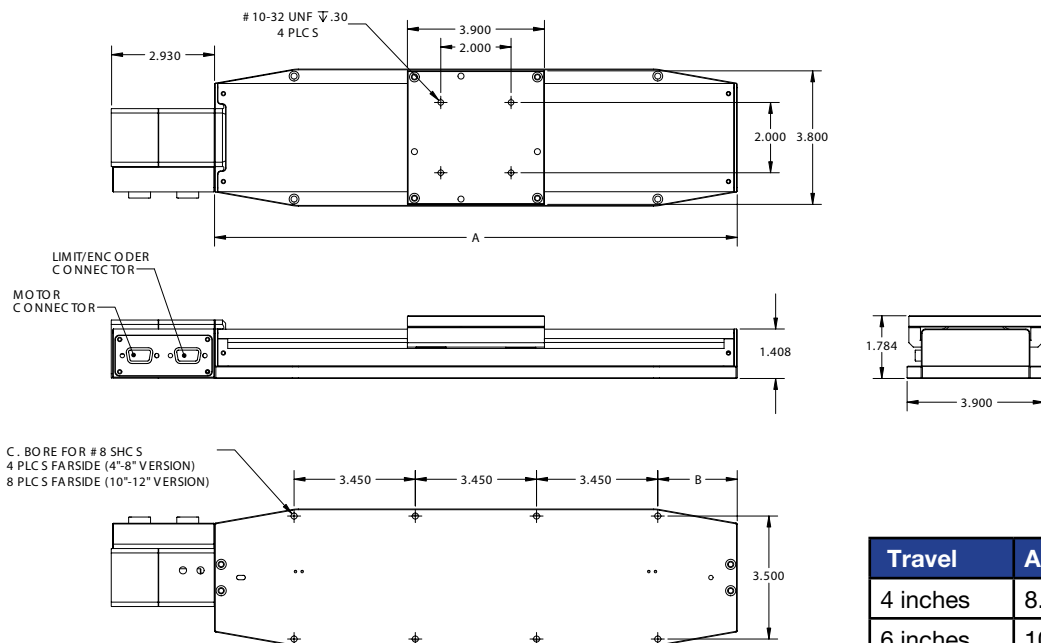
Note: Limit switches are wired normally open.

# NLS4 Series Dimensions

## 2.5 inch travel



## 4-12 inch travel



Travel	A	B
4 inches	8.875	2.713
6 inches	10.875	3.713
8 inches	12.875	4.713
10 inches	14.875	2.263
12 inches	16.875	3.263

# NLS4 Series Configurations

## CONFIGURATIONS

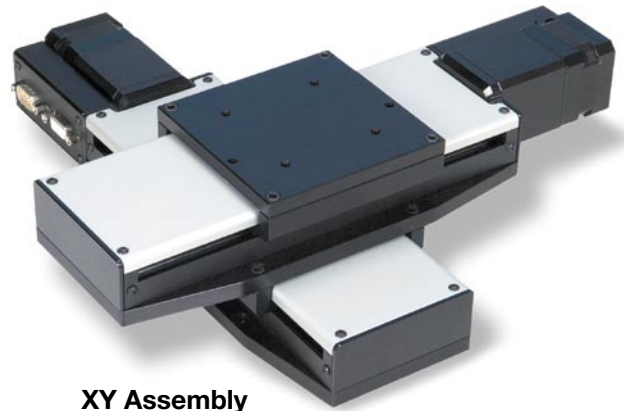
CONFIG-XY	XY assembly configuration
CONFIG-XYZ	XYZ assembly configuration
CONFIG-XZ	XZ assembly configuration
CONFIG-Z	Z assembly configuration

Please consult factory for pricing on specific configurations. Different travel lengths can be used in any configuration.

**XYZ Assembly**



**XY Assembly**



**XZ Assembly**



**Vertical Assembly**



# Motion Controllers

## MOTION CONTROLLERS

For optimum performance and seamless compatibility, we recommend using one of the following Motion Controllers/ Drivers.

### NSC-1S SERIES

The NSC-1S Series motion controller is a powerful single axis machine control system which combines a bipolar microstepping driver with a programmable controller into a compact envelope. The motion controller can operate as a stand-alone system through the RS-232 port. It utilizes a 32-bit microprocessor to control the trajectory profile, acceleration, velocity, deceleration. Our controller is commanded using virtually any programming language to pass simple ASCII command strings to the controller through the RS-232 port. If closed loop motion control is required, the NSC-1S can be expanded to handle differential inputs from an encoder.



**NSC-1S Series**  
Single Axis Stepper  
Motor Controller



**NSC-M Series**  
Multi Axis Stepper  
Motor Controller

### NSC-M SERIES

The NSC-M Series motion controllers are designed for use with all Newmark stepper motor systems. The controller can communicate with the host computer through an RS-232 interface. It can manage up to four axes and perform coordinated or independent motion of each or all the axes simultaneously. With built-in high level functionality, such as circular and linear interpolation, multi-tasking and custom profiling, programming the controller is greatly simplified.

The motion controller can operate as a stand-alone system through the RS-232 port. It utilizes a 32-bit microprocessor to control the trajectory profile, acceleration, velocity, deceleration and direction of selected axes.

Our multi-axes controller is commanded using virtually any programming language to pass simple ASCII command strings to the controller through the RS-232 port.

Newmark Systems, Inc is a worldwide leading designer and manufacturer of precision positioning systems for OEM applications as well as research and development for optical technologies. Newmark's products and expertise are increasingly utilized in sophisticated new technologies including semiconductor manufacturing and testing, and fiber optic communications.

Since 1995, Newmark Systems, Inc has consistently provided positioning equipment, motion control and optical solutions to a growing number of an elite group of industry leaders that includes names such as Hughes, Raytheon, Boeing, Textron, Intel, Lucent and Delphi.

Newmark's precision systems and components have also found a niche in the research arena. We are proud to have been able to provide quality engineering support and positioning components to Research organizations such as JPL, UCLA, TRW, Lawrence Livermore and Cornell University.



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