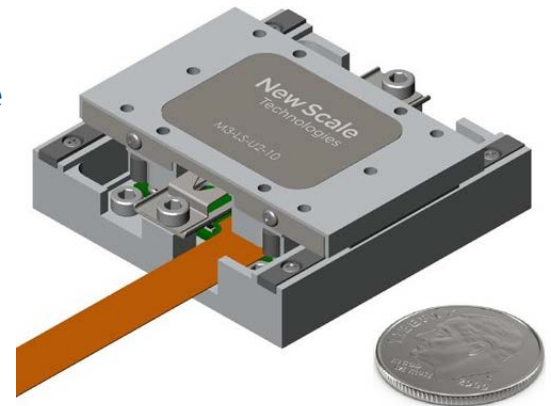


M3-LS-U2-10 Linear Smart Stage All-In-One Motion Module

- **Smart Stage:** Embedded controller, no separate electronics
Operate directly using I²C or SPI ASCII commands **-or-**
Evaluate using USB adapter to PC with Pathway™ Software
- **Cost-effective, long-life:** Suitable for high-volume production
- **Small size:** 32 x 32 x 10 mm
- **High resolution:** 0.5 μm with absolute encoding
- **High speed:** 35 mm/s
- **Long stroke:** 10 mm
- **Power:** 5 V DC input, ~2.3 W when moving, zero to hold
- **High repeatability** with precision linear guidance



The M3-LS-U2 Linear Smart Stage is an ultra-compact positioning stage with sub-micrometer resolution and absolute encoding. All electronics are built into the stage for simple system integration. This model is a cost-effective solution for high-volume product applications.

Precision, stability and ease of use for high volume product applications

The M3-LS-U2 Linear Smart Stage is a direct-drive, high-precision micro stage built for fast, simple integration into miniature OEM systems. All drive and control functions are embedded into the compact stage assembly – **no external electronics** are needed!

The stage drive is a UTAF2 piezo motor combined with a 0.5 μm resolution sensor for precise, repeatable positioning of optics, probes, sensors and more. The piezo motor operates at 5 VDC. No high voltage boost is needed. **Absolute encoding** removes the need to home the stage on power-up, eliminating errors and disruptions in processes and experiments.

The anodized aluminum stage uses linear ball bearing slides **with uniform and very low friction**. The bearings directly support the motor preload which creates a stable, precise and zero clearance guide system. The base is the maximum space required for installation in your product because the carriage moves within the total length of the base.

This smart stage is designed for long life and is ideal for embedding precision motion into high-volume products.

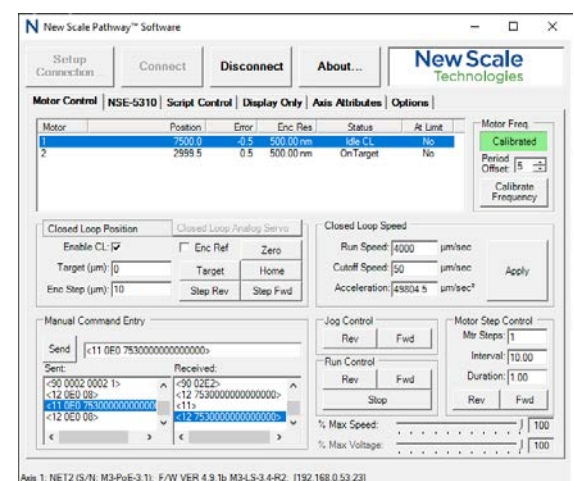
Digital Control and Pathway™ Software

The M3-LS-U2-10 Smart Stage can be driven directly via standard I²C or SPI serial protocols. The smart stage microprocessor accepts ASIC high-level motion instructions.

New Scale Pathway™ software and USB adapter enable PC control. All stage capabilities can be accessed including motion commands, performance diagnostics, stage settings and parameters stored in non-volatile memory. Use the intuitive script generator to create command sequences for automated operation.

APPLICATIONS

- DNA sequencing instruments
- Wearable medical devices
- Point-of-care diagnostic systems
- Handheld video microscopes
- Portable spectroscopy instruments
- Handheld imaging systems
- Biomedical probing & sampling
- Laser beam steering
- Miniature camera systems
- And much more



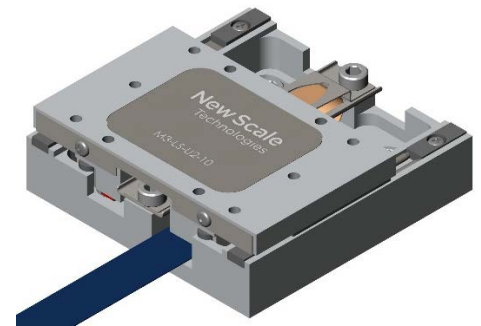
New Scale Pathway™ software with easy-to-use graphical interface. Control multiple smart stages from one PC screen, or develop your own code using the intuitive scripting tool.

Specifications (PRELIMINARY)

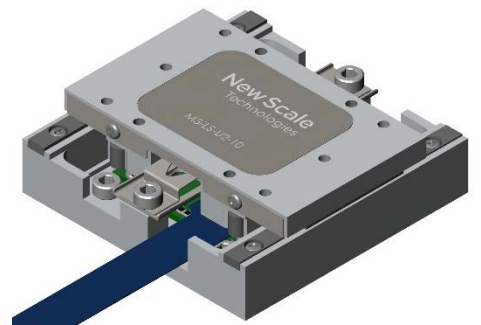
M3-LS-U2-10 Linear Smart Stage specifications	
MODEL	M3-LS-U2
Stroke	10 mm
Dimensions	32 x 32 x 10 mm <i>including controller</i>
Mass of Smart Stage	15 grams <i>including controller</i>
Moving mass (vertical) (note 1)	≤ 20 grams recommended
Moving mass (horizontal) (note 1)	≤ 40 grams (offset < 10 mm) recommended
Force (operating)	0.2 N
Speed (at operating force)	35 mm/sec
Closed-loop performance	
Resolution	0.5 μm with absolute encoding
Bi-directional repeatability	± 5 μm
Accuracy	± 20 μm
Input Power	~ 2.3 W peak at max speed and force
Input Voltage	5 V DC (4.75 V to 5.5 V)
Mechanical stage	
Static parallelism	< 30 μm
Runout	< 10 μm
Pitch and yaw	< 1 mrad
Absolute maximum loads	See Chart
Environment	
Relative humidity	< 70%
Operating temperature (note 2)	-30 °C to +70 °C
Storage temperature	-40 °C to +80 °C
Lifetime	50 km
Compliance	CE / RoHS
Drive electronics	Integrated into the smart stage
Control interface	Directly via I ² C or SPI interface. Indirectly via USB adapter to PC.
Standard Cable Length	9 cm
Maximum Cable Length	60 cm, > 25 cm requires reduced clock rate

Note 1: Higher mass is possible but will affect performance and lifetime.

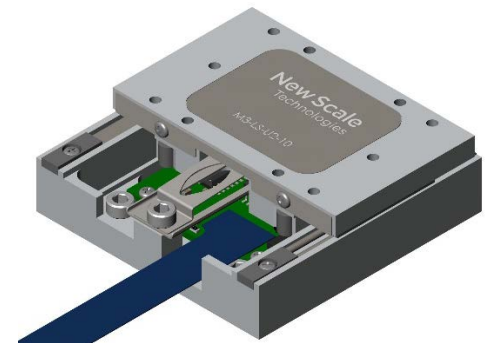
Note 2: Speed and force reduced at lower temperatures within the range.



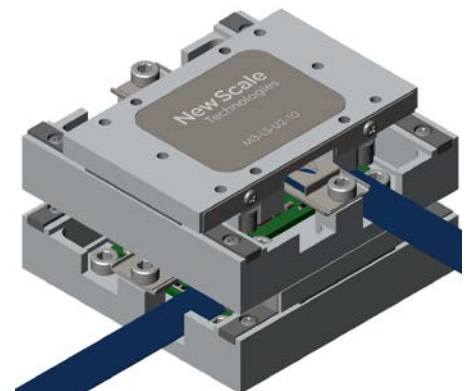
Forward Position



Center Position



Reverse Position



X-Y Assembly (Centered)

Single Stage Dimension (Also see Drawing 07463-8-0000)

