

M3-L Precision Linear Motion Modules



High resolution M3-L linear motion modules

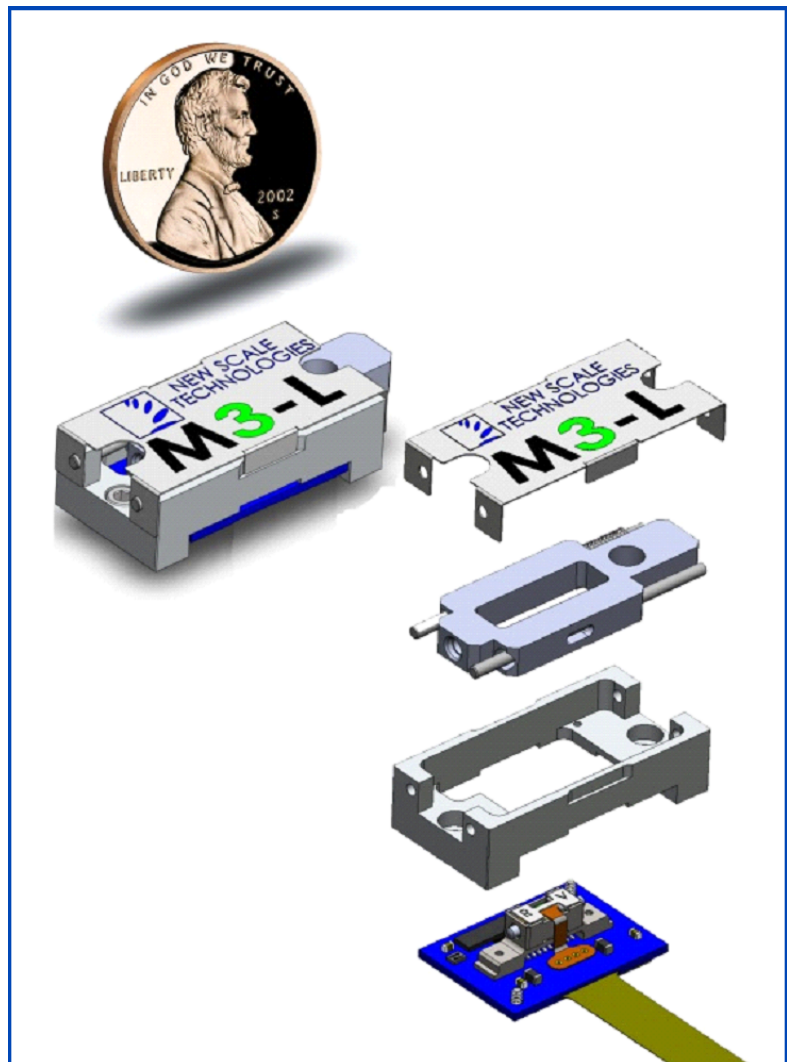
The M3-L is the world's smallest, high-resolution, low-voltage, closed-loop linear motion system. M3-L provides 0.5 micron position resolution at less than half the size and one-fourth the weight of comparable positioning systems. Travel range is up to 6 mm. Our world-class micro-mechatronics engineering team can provide expertise in your application-specific, single or multi-axis design, providing unrivalled precision in the smallest possible spaces.

The M3_L is ideal for precision automated control of variable inductors and trimmer capacitors in RF and microwave tuning systems, and of optical elements in photonics tuning systems. It provides reliable performance in a wide range of optical, handheld and precision instrumentation for defense, security and biomedical products.

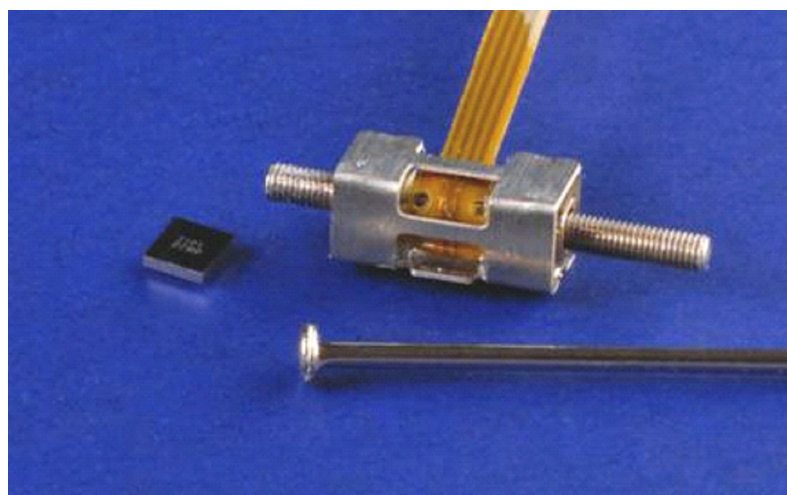
Figure 1:
Features and Applications

Features	Applications
<ul style="list-style-type: none"> • Small <ul style="list-style-type: none"> - Complete, closed-loop controls in a size less than 27.5 x 13 x 7.5 mm • Precise <ul style="list-style-type: none"> - 0.5 μm resolution - 6 millimeters of travel • Integrated M3 Motion Control Platform <ul style="list-style-type: none"> - Complete closed-loop motion control system - Simple serial commands (I²C or SPI) - Rapidly customizable - Prototypes designed to your application • Low Voltage / Low Power <ul style="list-style-type: none"> - 3.3 Volt input - <500 mW - Holds position when power is off 	<ul style="list-style-type: none"> • High Resolution Tuning Systems • Hand-held Instrumentation • Precision Photonics • Targeting System • UAV/UGV Controls and Optics • Miniature Camera Systems • Micro Surgical Devices

The M3-L linear module is a drop-in, sub-micron linear positioning solution that meets the most demanding motion control requirements. These modules are easily configured for single or complex multi-axis systems.



SQUIGGLE RV motor and driver inside every M3-F module is the world's smallest linear motor system.



The M3 micro-mechatronic platform

M3-L module is built on New Scale's M3 Micro-Mechatronic Module technology platform: the smallest, highest resolution and most repeatable closed-loop micro-mechatronic system available – all in an easily integrated, customizable package. The platform includes a patented SQUIGGLE® RV piezo micro motor, an NSD-2101 drive ASIC, an NSE-5310 high-resolution magnetic position sensor, and a microprocessor. These combine to create the world's smallest closed-loop linear motion system, with performance comparable to much larger systems. The modules operate on 3.3V input and accept simple high-level motion commands via standard serial interface.

M3-L Developer's Kits

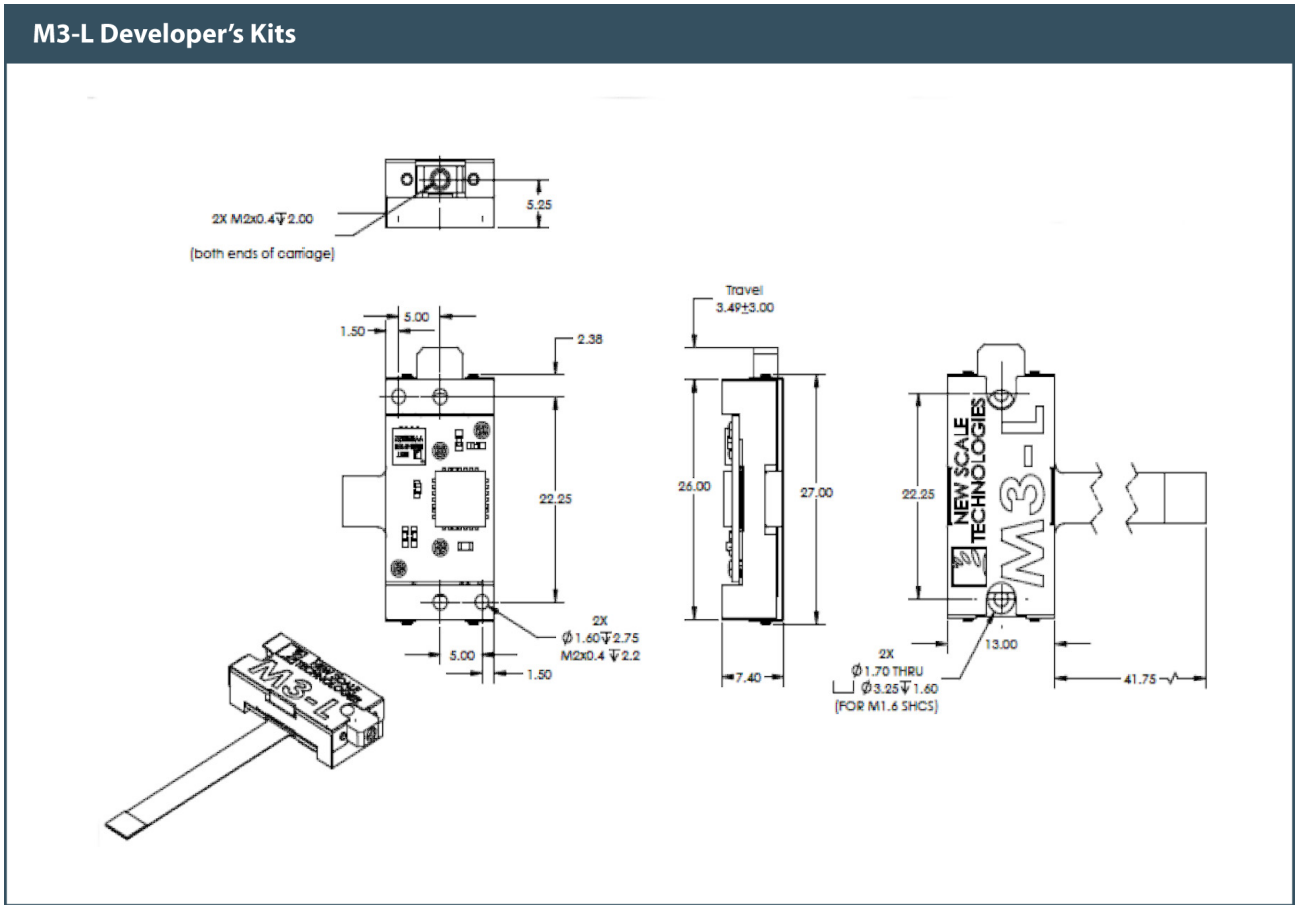
The M3-L Developer's Kits provide a convenient platform for initial evaluation and integration into your prototype platform. The kit includes an M3-L linear positioning module and a USB stick to convert computer commands directly from New Scale Pathway™ PC software into SPI commands for the linear module. Standard tips included are bullet nose for push and eye end for pulling.

Custom M3-L Linear Module System Development

The Developer's Kit is designed to help engineers define system specifications for subsequent development of custom micro motion modules with New Scale Technologies. In addition to bi-directional (push/pull) systems and custom tips, we can create systems to address your requirements for travel range, module size, force, environmental and more. Please see the module specification worksheet at:

http://www.newscaletech.com/contact_M3-L-RFP.aspx

Figure 2:



M3-L Developer's Kits allow OEMs to rapidly integrate miniature, high resolution linear motion controls with up to 6 mm total travel. Kits include one M3-L module, USB control stick with SPI output, and New Scale Pathway™ software.



Figure 3:
M3_F Module Specifications

M3-F Module Specifications	
Travel Range	6 mm
Housing Dimension	27.5 x 13 x 7.5 mm
Speed	5 mm/s @ 0.15N load (typical)
Resolution	0.5 μ m
Linear Accuracy	\pm 25 μ m
Maximum Load (Push Pull Stall Force with \pm 1 degree axial alignment)	<0.20 Newtons
Maximum Recommended Mass	5 grams
Input Voltage	3.1 - 3.6 V
Input Power**	< 0.5 Watts (5mm/s at 0.15 Newtons) < 0.2 Watts quiescent
Digital Interface	I ² C or SPI
Weight (without tip)	4.5 grams

** Power depends on input voltage, speed & load.

Ordering information

Order Developer's Kits online at Digi-Key:
<http://www.digikey.com/product-detail/en/DK-M3L-1.8-TRK-6.0-S/DK-M3L-1.8-TRK-6.0-S-ND/2563771>

Integration information

Additional information including integration guide and CAD file is available on this website: Please register at:

http://www.newscaletech.com/register_for_download.php

Figure 4:
Part Number and Description

Part Number	Description
DK-M3L -1.8-TRK-6.0-S	M3-L Linear Micro-mechatronic developer's kit. Includes M3-L module, push and pull ends, USB adapter (SPI), connecting cables, mounting hardware and New Scale Pathway software.