M3-F
Micro-Mechatronic Focus Modules

NEW SCALE TECHNOLOGIES
Ingeniously Small Motion Systems

1 General Description

High-resolution M3-F Focus Modules.

The M3-F focus module provides the ultimate in high-resolution lens positioning, integrated into an extremely small and flexible package. The M3-F allows you to rapidly add motorized focus capability to your board-mounted camera without increasing system size. The M3-F's miniature size and low power consumption make it an ideal solution for portable, battery-operated devices. The integrated microcontroller accepts position commands and PID control settings from your camera processor over a digital I²C or SPI serial interface. These advanced features provide rapid and precise lens position control with 0.5 micron resolution to capture the sharpest images from your board-mounted camera system.

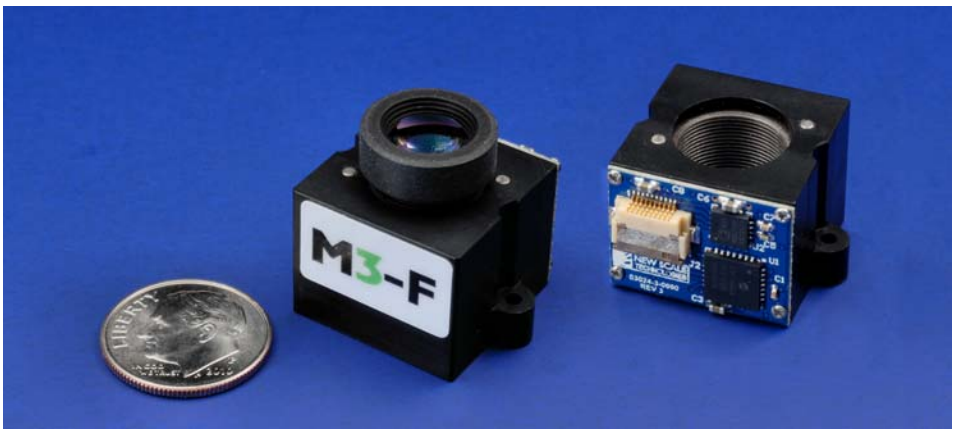
2 Key Features

- Small
  - M8 to M12 Lens Sizes
  - Assemblies less than 20 X 22 X 16 mm
- Precise
  - 0.5 µm resolution
  - Better than 30 µm accuracy
- Integrated M3 Motion Platform
  - Complete closed-loop motion control system
  - Simple serial commands
  - Rapidly customized to your image sensor and lens
  - Prototypes in as little as 8 weeks
- Low Voltage / Low Power
  - 3.3 Volt input
  - < 500 mW
  - Focus is fixed when power is OFF

3 Applications

The M3-F is ideal for miniature, high-resolution cameras:

- Biometric Systems
- Infrared Cameras
- Machine Vision
- Industrial Inspection Systems
- Medical Inspection Systems
- Conferencing Systems
- Miniature Surveillance Cameras
- Video Cameras
- Computer Cameras
- Projectors
- Targeting System

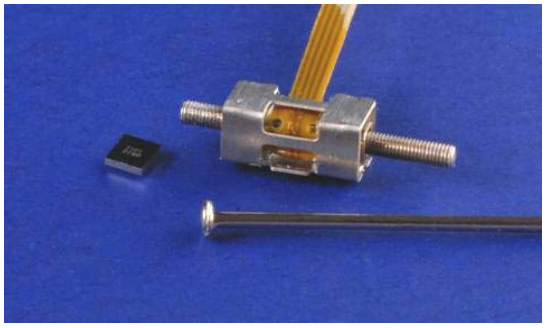


3.1 The M3 Platform

The heart of the M3-F module is New Scale's M3 Micro-Mechatronic Module technology platform. The platform provides 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. Focus modules created on the M3 platform provide reliable and unparalleled performance.

Flexibility and Precision: M3-F modules are easily integrated with your camera board and lens. The M3-F is a drop-in focus solution that requires no additional space.

SQUIGGLE RV motor, NSD-2101 Driver and NSE-5310 sensor inside each M3-F module. These components provide the world's smallest most precise closed-loop motion controls.



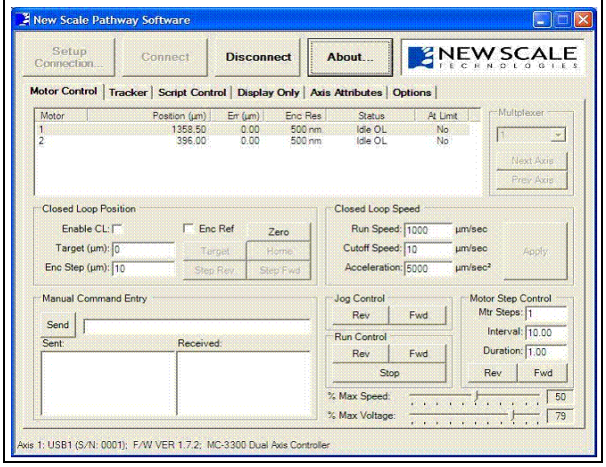
3.2 M3-F Developer's Kits

The M3-F Developer's Kit provides a convenient platform for engineering evaluation and demonstration of focus in your camera. The Developer's Kit includes a focus module and a USB stick to convert computer commands directly from New Scale Pathway™ PC software to the focus module. Kits can accept a broad range of lenses and accommodate image sensors up to 17 x 17 x 3 mm, and are available pre-configured to accept I²C or SPI serial commands.

The design note "Checking Optical and Imager Geometry in DK-M3-F" provides lens recommendations and guidelines for determining your image sensor and lens compatibility.

The download is available at http://www.newscaletech.com/application_notes.html

New Scale Pathway™ software provides an intuitive development platform for the M3-F modules.



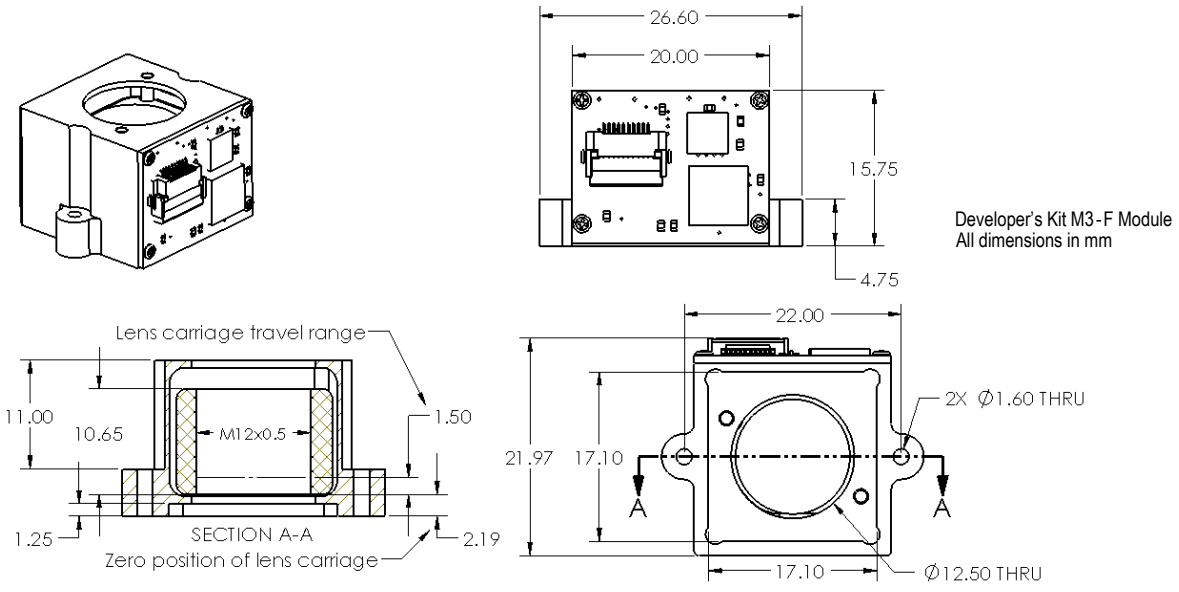
Developer's Kit includes a focus module and a USB stick to convert computer commands directly from New Scale Pathway™ using your PC.

3.3 M3-F Developer's Kit Specifications

Lens (not included)	Accepts M12x0.5mm, smaller lenses to M8x0.35 with adapter from your lens supplier.
Lens weight[1]	< 5 grams
Travel Range	Up to 1.5 mm
Housing Dimension	20 x 22 x 16 mm
Maximum Image Sensor Area (image sensor not included)	17 x 17 x 3 mm
Speed	> 5 mm/s
Resolution	0.5 µm
Linear Accuracy	± 30 µm
Angular alignment (Static tip/tilt)	<± 1 degrees
Angular movement (Dynamic tip/tilt)	<± 0.5 degrees
Static Concentricity	<± 0.25 mm
Dynamic Concentricity	<± 0.02 mm
Input Voltage	3.1 to 3.6 Volts
Input Power[2]	< 0.5 Watts (5mm/s with 5g mass) < 0.13 Watts quiescent
Weight of module (without lens)	5.8 grams

1. Horizontal orientation will allow for heavier lens operation.
2. Power depends on input voltage, speed & load.

Figure 1. Package Drawings & Dimensions



3.4 Request for Custom Proposal

The M3 platform allows us to quickly create a customized focus module to your more demanding OEM specifications. Our sales and engineering team will rapidly respond to your request. To request design customization, please complete our on-line module specification worksheet at http://www.newscaletech.com/contact_AF-RFP.aspx

4 Ordering Information

Developer's Kits can be purchased online at http://shop.newscaletech.com

Ordering Code	Description
DK-M3F-1.8-TRK-1.5-C	Configured for I²C (Inter-Integrated Circuit Bus)
DK-M3F-1.8-TRK-1.5-S	Configured for SPI (Serial Peripheral Interface Bus)

Note: All products are RoHS compliant and Pb-free.
Buy our products or get free samples online at ICdirect: http://www.austriamicrosystems.com/ICdirect

Technical Support is found at http://www.austriamicrosystems.com/Technical-Support

For further information and requests, please contact us: mailto:sales@austriamicrosystems.com
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