

Checking Optical and Imager Geometry for use in M3-F Developer's Kits

Prior to purchasing the M3-F Micro-mechatronic Focus Module Developer's Kit, you should verify compatibility of configuration to your lens and imager format. This design note outlines how to validate system compatibility.

1. What do you need to know?

You will need the following basic parameters to understand whether your component will work with the M3-F Developer's Kit:

- ▶ Mounting Hole Pattern
- ▶ Lens Thread
- ▶ Lens Dimensions
- ▶ Lens Focal Length for Your Imager Size
- ▶ Lens Travel Required
- ▶ Imager Array Thickness (Mounted) and Diagonal Dimension
- ▶ Lens Viewing Angle

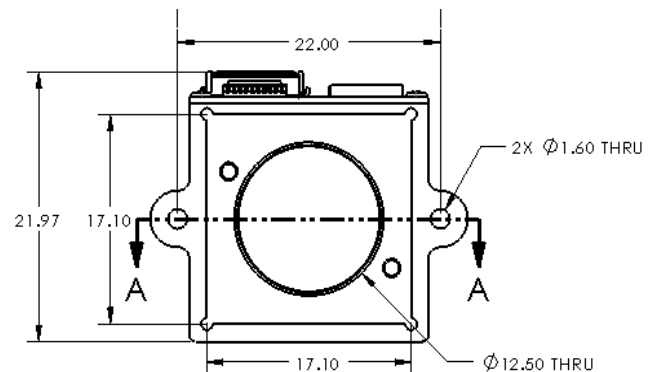


Figure 1: M3-F Developer Kit Module Footprint

2. Mounting Requirements

The M3-F Developer's kit is designed with a base as shown in Figure 1. Check the dimensions to ensure that no interferences to components on your imaging board exist. Holes are compatible for clearance of M1.4 or UNF 0-80 screw. If hole patterns are not compatible, you will need to either provide screw mounting holes or to adhesively mount the module onto the board surface.

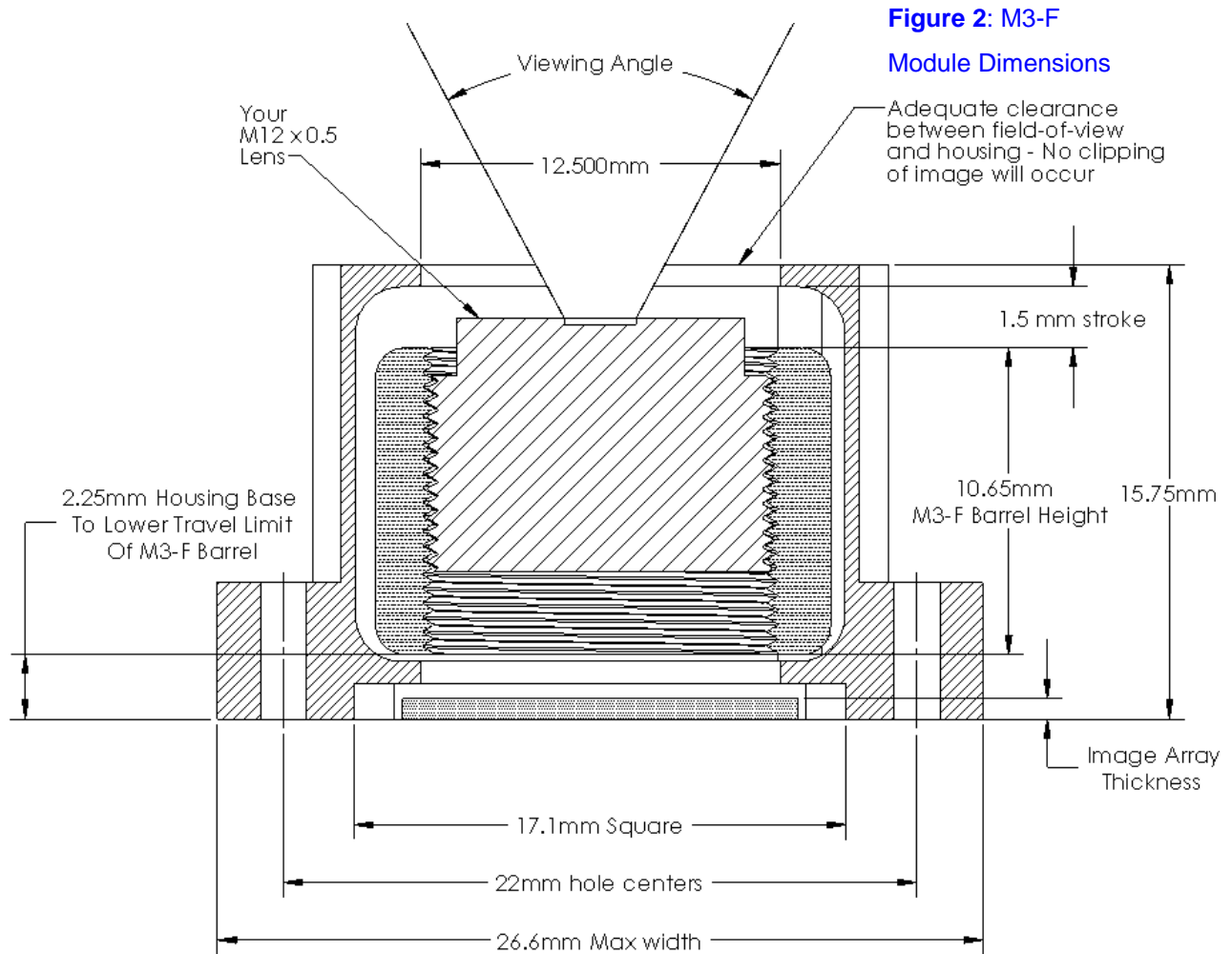
3. Position of the Lens Relative to the Image Sensor

A typical image sensor array thickness can be 0.7 to 1.0 mm. You need to establish the board-mounted position of the top of your image sensor array, as well as its diagonal image dimension (Figure 2). This information can be provided by your image chip or camera board supplier. The infinite focus position to the top surface of the sensor should establish the lower position of the lens assembly for the lens you require.

4. Lens Specifications

The maximum travel of the M3-F in the developer's kit is 1.5 mm. The upper and lower range of this is a factory setting and established to avoid over-travel of the lens barrel. The zero reference position places the base of the adjustable M3-F barrel at 2.25 mm from mounting base (Figure 2). This travel results in a fully extended travel limit of the base of the barrel at 3.75 mm above the mounting base. Full travel range for your optical system must be less than or equal to 1.5 mm.

The M3-F Module is provided with a 10.65 mm length threaded barrel to allow insertion of M12X0.5 mm lenses. See Figure 2. Check that the lens you wish to use is also an M12X0.5 mm lens. Smaller lenses may be used, however an adapter will be required. An optional M8X0.5 mm adapter is available for this kit.



Additional basic information that you need from your lens provider would include outer dimensions, infinite focus distance for the imager sensor array geometry and viewing angle. With the lens placed in a position of infinite focus, ensure that the field of view angle does not intersect the M3-F housing (Figure 2). This will ensure that clipping of your image will not occur. For lenses that include a flange (Figure 3), interference with the outer M3-F housing needs to be checked at this lowest lens position as well.

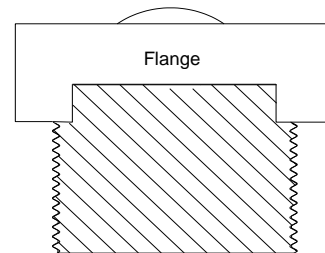


Figure 3: Lens with Flange

To allow you to perform a geometric analysis with your image array and lens combination, a cross sectional dxf and pdf file of the M3-F module are available for download from our website at http://www.newscaletech.com/register_for_download.php (registration required).

5. Example Lens and Imager Sensor Array Formats

The table below lists examples of lens and sensor configurations that are suitable for use with the M3-F Developer's Kit.

Model #	Imager format (diagonal)	Thread
Sunex DSL853(X)	½" (16mm)	M12X0.5P
Sunex DSL935	1/1.8" (8.89mm)	M12X0.5P
Sunex DSL944 (requires optional adapter CMT0805-1205 from Sunex)	1/2.5" (7.2mm)	M8x0.35-6h

6. Conformance Information

The M3-F module conforms to the following standards:

EMC Directive: 2004/108/EC

Generic Emissions Standard: EN 61000-6-3: 2007

Product Specific Emissions: EN 55022

Generic Immunity Standard: EN 61000-6-1: 2007

Immunity: EN 61000-4-2 Electrostatic Discharge

EN 61000-4-3 Radiated Susceptibility

EN 61000-4-8 Magnetics

FCC Rules and Regulations:

United States 47 Code of Federal Regulations Part 15 – Electromagnetic Emissions, Class B Devices

Standards:

ANSI C63.4-2003, Methods of Measurement of Radio-Noise

Emissions from Low-Voltage electrical equipment in the range of 9kHz to 40GHz.

Section 11.0 Measurement of Information Technology Equipment (ITE)

RoHS Compliance:

This document certifies that the products listed in this document and manufactured by New Scale Technologies do not to the knowledge of the certifier contain the substances listed in the table below in concentrations exceeding the Maximum Control Value (MCV), and will be compliant as of the date listed.

For Additional M3-F Module Questions

Please refer to the M3-F Datasheet for system specifications. If you have additional questions regarding the M3-F Developer's Kit integration or for custom design requirements, please contact us at sales@newscaletech.com or call (585) 924-4450.