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THORLABS

R1L3S8P - February 22, 2018

Item # R1L3S8P was discontinued on February 22, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

CALIBRATION TARGETS

- **Stage Micrometers and Concentric Squares for Calibrating Distances**
- **Allows for Precise Measurements of Enlarged Images**

R1L1S4P
Stage Micrometer

R1L1S4P
Stage Micrometer

R1L3S8P-O
Dual-Axis Stage Micrometer
and Concentric Square Target

R3L3S3P
Concentric Square Calibration Target

Hide Overview

OVERVIEW

Features

- Horizontal and Vertical Stage Micrometers with Divisions from 10 µm to 100 µm
- Concentric Squares with Fourteen Positive Pattern Sizes from 0.1 mm to 50 mm
- Combined Dual-Axis Horizontal and Vertical Stage Micrometers with Concentric Square Patterns

Click to Enlarge
An R1L3S1P Stage Micrometer Mounted in an XYFM1 Test Target Positioner

Thorlabs offers several options for calibrating distances in an imaging system. Our stage micrometers are available with horizontal or vertical scales with divisions ranging from 10 to 100 µm. Our concentric square pattern features twenty-eight squares (fourteen negative and fourteen positive) with dimensions ranging from 0.1 mm to 50 mm. Finally, a target that combines a horizontal and vertical micrometer with fourteen concentric squares is also available.

General Specifications		
Substrate	**Soda Lime**	**Opal**
Chrome Thickness	0.120 µm	
Chrome Optical Density	OD ≥3 at 430 nm	
Substrate Thickness	0.06" (1.5 mm)	0.12" (3.1 mm)
Surface Flatness	<5 µm	3λ @ 632.8 nm
Line Spacing Tolerance[a]	±1 µm	
Line Width Tolerance[a]	±0.5 µm	

- This tolerance is valid for the mask used to create these targets and may differ minimally for the targets themselves.

All of our test targets are available on a soda lime glass substrate with vacuum-sputtered, low-reflectivity chrome. Our combined stage micrometer and concentric square target is also available on an opaque opal substrate with the same low-reflectivity chrome (item # R1L3S8P-O). Each pattern is manufactured using photolithography, allowing for edge features to be resolved down to approximately 1 µm.

Mounting

These test targets can be mounted in one of four of our microscopy slide holders. Our MAX3SLH fixed slide holder provides two spring clips to mount the optic and can be mounted to any of our 3-axis flexure stages. The MAX3SLH is only compatible with test targets greater than or equal to 2" wide and provides a clear aperture of 1", which may cover the chrome pattern on some of the test targets. Thorlabs also offers our XYFM1(/M) test target positioning mount (see photo above) capable of translating a 1" (25.4) to 3" (76.2 mm) wide rectangular target over a 50 mm (1.97") x 30 mm (1.18") area. An adapter on the back of the mount contains five 8-32 (M4) taps for various post-mountable orientations. The XYFM1 uses nylon-tipped setscrews to secure the optic. This will slightly cover the edges of the optic and can, in some instances, cover the chrome pattern on test targets. For users of the MLS203 microscopy stage, we offer the MLS203P2 slide holder for inverted microscopes, which can mount slides 25 mm to 26.5 mm wide and petri dishes 30 mm to 60 mm in diameter.

Targets Selection Guide			
Resolution Test Targets	Distortion Test Targets	Slant Edge MTF Resolution Test Targets	Calibration Targets

Hide Custom Targets

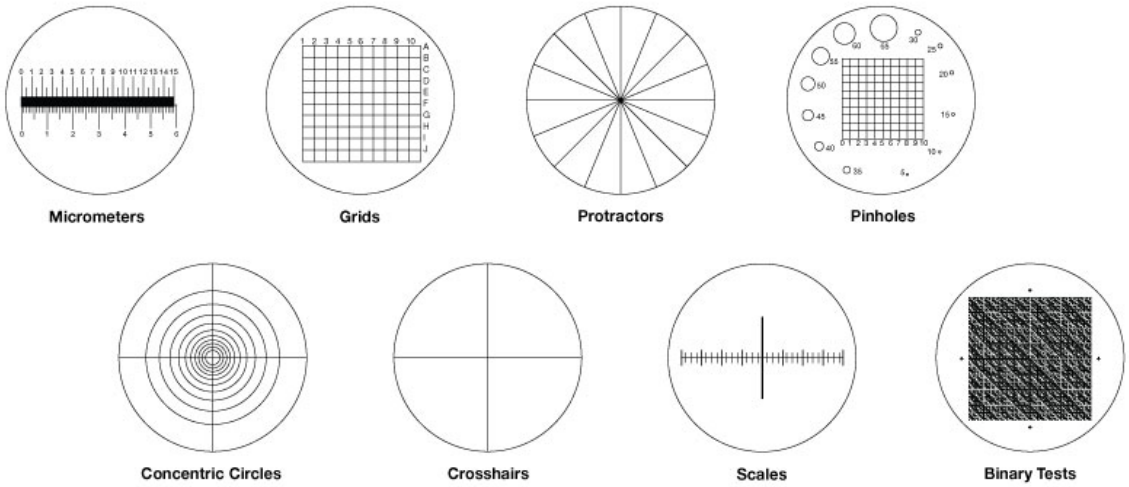
CUSTOM TARGETS

Custom Test Targets

Thorlabs has extensive design and production capabilities for test targets and reticles. All of our test targets, stage micrometers, distortion grids, and reticles are manufactured in-house at our Thorlabs Quantum Electronics (TQE) division in Jessup, Maryland. In addition to the test targets that are offered from stock, we can provide custom patterns and sizes (circular, square, and rectangular), a sample of which are shown below. Please note that there is a significant tooling cost and lead time for custom test target patterns that makes the purchase of only a few pieces fairly costly.

We are also able to provide versions of our stock target patterns with an AR coating on the substrate or a higher or lower optical density. While most of our targets are sold from stock on soda lime glass, we are able to provide patterns on other substrates, such as opal.

For more information about our photolithography production, please see our presentation on Thorlabs Semiconductor Manufacturing Capabilities. For a quote on custom test targets, please contact Tech Support.



Hide Mounting Options

MOUNTING OPTIONS

Mounting Options					
Mount Item #	**MAX3SLH**	**XYFM1**	**MLS203P2**	**FFM1 with B3C**	**SFH2**
Image (Click to Enlarge)					
		a			

Compatible Target Item #s	R1L3S1P, R1L3S2P, R1L3S8P, R1L3S8P-O	R1L1S4P, R1L1S5P , R1L3S1P, R1L3S2P, R3L3S3P, R1L3S8P, R1L3S8P-O	R1L1S4P, R1L1S5P	R1L1S4P, R1L1S5P, R1L3S1P, R1L3S2P, R3L3S3P, R1L3S8P	R1L1S4P, R1L1S5P, R1L3S1P, R1L3S2P, R3L3S3P, R1L3S8P, R1L3S8P-O
Features/Mounting	Mounts to 3-Axis Stages or Any with 1/4"-20 Taps	XY Translation Ø1/2" Post Mountable	Mounts to Our MLS203-1 and MLS203-2 Fast XY Scanning Stages	Ø1/2" Post Mountable	Ø1/2" Post Mountable

- The pattern on this target will be partially obscured by this mount.

Hide Stage Micrometers, 1" x 1"

Stage Micrometers, 1" x 1"

- 1" x 1" (25.4 mm x 25.4 mm) Stage Micrometers
- For Calibrating Eyepiece Reticles or Objective Magnification
- R1L1S4P: 10 mm Vertical Scale with 100 µm Divisions
- R1L1S5P: 20 mm Horizontal Scale with 100 µm Divisions and Crosshair

These targets each feature a stage micrometer pattern with 100 µm divisions and numerical labeling every 1 mm. The R1L1S4P micrometer is oriented vertically and has a 10 mm long scale, while the R1L1S5P micrometer is oriented horizontally with a 20 mm long scale and a perpendicular crosshair. Both targets consist of a 1" x 1" soda lime substrate with low-reflectivity, vacuum-sputtered chrome. These positive targets are useful for the calibration of distances within imaging systems.


Click to Enlarge
Close Up of the R1L1S4P Vertical Scale

Click to Enlarge
Close Up of the R1L1S5P Horizontal Scale with Crosshair

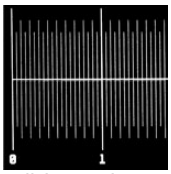
Part Number	Description	Price	Availability
R1L1S4P	**10 mm Stage Micrometer with 100 µm Divisions, 1" x 1", Soda Lime Glass**	**$125.46**	**Today**
R1L1S5P	**20 mm Stage Micrometer with 100 µm Divisions, 1" x 1", Soda Lime Glass**	**$125.46**	**Lead Time**

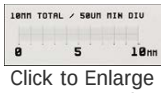
Hide Stage Micrometers, 3" x 1"

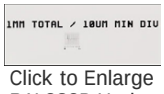
Stage Micrometers, 3" x 1"

- For Calibrating Eyepiece Reticles or Objective Magnification
- R1L3S1P: 10 mm Scale with 50 µm Divisions
- R1L3S2P: 1 mm Scale with 10 µm Divisions
- Scales Centered on a 3" x 1" (76.2 mm x 25.4 mm) Microscope Slide

These targets each feature a horizontal stage micrometer pattern. The R1L3S1P micrometer has a 10 mm long scale with 50 µm divisions and numerical labeling every millimeter, while the R1L3S2P has a 1 mm long scale with 10 µm divisions and numerical labeling every 0.1 mm. Both targets consist of a 3" x 1" soda lime substrate with low-reflectivity, vacuum-sputtered chrome. These positive targets are useful for the calibration of distances within imaging systems.


Click to Enlarge
Microscope Image of R1L3S1P Stage Micrometer


Click to Enlarge
R1L3S1P Under Magnification


Click to Enlarge
R1L3S2P Under Magnification

Part Number	Description	Price	Availability
R1L3S1P	**10 mm Stage Micrometer with 50 µm Divisions, 3" x 1", Soda Lime Glass**	**$182.58**	**Lead Time**
R1L3S2P	**1 mm Stage Micrometer with 10 µm Divisions, 3" x 1", Soda Lime Glass**	**$162.18**	**Lead Time**

Hide Concentric Squares, 3" x 3"

Concentric Squares, 3" x 3"

- 3" x 3" (76.2 mm x 76.2 mm) Concentric Square Target
- Calibrate a Measurement for Imaging Software
- Low-Reflectivity, Vacuum-Sputtered Chrome

Click to Enlarge Close Up of the Squares Smaller than 15 mm Wide on R3L3S3P Concentric Square Target

Click to Enlarge R3L3S3P Concentric Square Pattern

The R3L3S3P Concentric Square Target features fourteen concentric squares with lengths and widths ranging from 0.1 mm to 50 mm (see table below). Each square is labeled with its width on the target. This target is made from a soda lime glass substrate with low-reflectivity, vacuum-sputtered chrome. These positive targets are useful for the calibration of distances within imaging systems.

Widths of Positive Squares (mm)

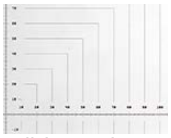
- 0.1
- 0.25
- 0.5
- 1
- 2
- 3
- 4
- 5
- 10
- 15
- 20
- 30
- 40
- 50

Part Number	Description	Price	Availability
R3L3S3P	Positive Concentric Square Test Target, 3" x 3", Soda Lime Glass	$364.14	Lead Time

Hide Dual-Axis Stage Micrometer and Concentric Squares Target, 3" x 1"

Dual-Axis Stage Micrometer and Concentric Squares Target, 3" x 1"

- 3" x 1" (76.2 mm x 25.4 mm) Combined Dual-Axis Stage Micrometer and Concentric Squares Target
- For Calibrating Eyepiece Reticles or Objective Magnification
- Soda Lime Glass (R1L3S8P) or Opal (R1L3S8P-O) Substrate
- One Imperial and One Metric Pattern on Each Target



Click to Enlarge Close Up of the Imperial Micrometer and Concentric Squares

Thorlabs' R1L3S8P and R1L3S8P-O targets combine a dual-axis stage micrometer pattern with a concentric square pattern. The R1L3S8P consists of low-reflectivity, vacuum-sputtered chrome plated onto a transparent 0.06" (1.5 mm) thick soda lime substrate. Alternatively, the R1L3S8P-O features the same low-reflectivity chrome pattern plated onto an opaque, 0.12" (3.1 mm) thick white-flashed opal substrate. Soda lime is useful for transmissive applications, whereas opal should be used for reflective applications.

Each target includes one pattern with imperial measurements on the right and one pattern with metric measurements on the left. The details of each pattern are given in the *Pattern Features* table below. These positive targets are useful for the calibration of distances within imaging systems.

Pattern Features		
Pattern Type	**Imperial**	**Metric**
Stage Micrometer	1" X-Axis and 0.6" Y-Axis Scales with 0.001" Divisions and Numerical Labeling[a] Every Five Divisions (0.005")	25 mm X-Axis and 15 mm Y-Axis Scales with 25 µm Divisions and Numerical Labeling[a] Every Five Divisions (125 µm)
Concentric Squares	14 Squares (Width/Height Sizes): 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 300, 400, 500, 600 Divisions (0.02", 0.04", 0.06", 0.08", 0.1", 0.12", 0.14", 0.16", 0.18", 0.20", 0.30", 0.40", 0.50", 0.60")	14 Squares (Width/Height Sizes): 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 300, 400, 500, 600 Divisions (0.5 mm, 1 mm, 1.5 mm, 2.0 mm, 2.5 mm, 3.0 mm, 3.5 mm, 4.0 mm, 4.5 mm, 5.0 mm, 7.5 mm, 10.0 mm, 12.5 mm, 15.0 mm)

- The numerical labels are given in units of divisions, rather than in inches or millimeters.

Part Number	Description	Price	Availability
R1L3S8P	Customer Inspired!Stage Micrometer and Concentric Squares Target, 3" x 1", Soda Lime Glass	$312.12	Lead Time
R1L3S8P-O	Customer Inspired!Stage Micrometer and Concentric Squares Target, 3" x 1", Opal Glass	$395.76	3-5 Days