imatest®

Product Brochure

Comprehensive solutions for
image quality testing

2026, Vol. 1

About Imatest

Imatest provides customers with software, services, charts, and equipment to meet and exceed image quality testing standards.

Global Partner and Reseller Network

Imatest has a global network of trusted resellers and equipment partners that offer local support and value-added products.

imatest.com/resellers

sales@imatest.com
720-328-5105

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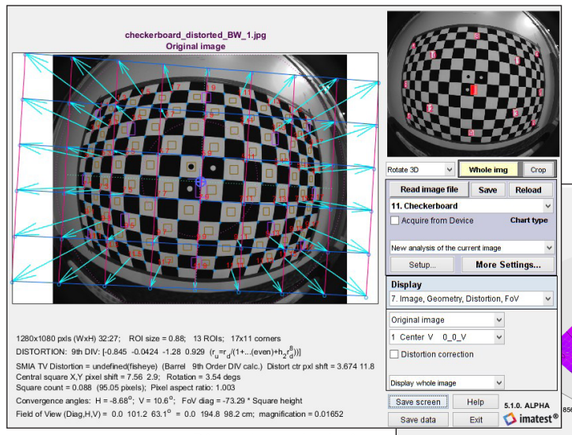
Imatest Master

Image quality analysis software with user interface

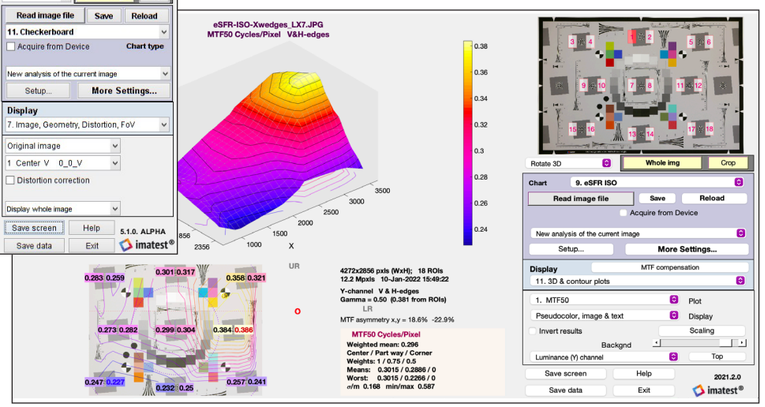
Why Choose Imatest Master?

> *We decided to leverage Imatest, a de facto industry standard, instead of developing our own image quality testing metrics.*
>
> *Signal Processing Software Manager at a Leading Semiconductor Firm*

In today's imaging industry, companies are pressured to produce high-quality cameras with the newest features. Yet, new features also mean the necessity for regular updates so industry standards are always met. Imatest Master streamlines this challenging process by providing state-of-the-art software that is regularly re-engineered to meet customer requirements. In addition, Imatest Master can test nearly any conceivable type of camera for over a dozen image quality factors, including sharpness, noise, dynamic range, and color accuracy.



Distortion calculation



eSFR ISO 3D Plot

Highlighted Features

- ✓ **eSFR ISO** tests numerous image quality factors with a single multi-feature test chart.
- ✓ **Arbitrary Charts** can automatically test your own custom chart.
- ✓ **Image Acquisition** acquires images in real time from various sensors and cameras.
- ✓ **Test Manager** organizes a set of modules to run with user-defined test plans and stores results in a database.
- ✓ **Reports** feature creates custom interactive reports with the results you define.
- ✓ **Compatibility** with both the Imatest Light Box and Imatest Light Panel.

Benefits of Imatest Master

- ✓ Imatest Master is the industry standard for communicating image quality results and is more reliable and cost-effective than creating in-house software.
- ✓ Automatic recognition of common chart features like those found in the SFRplus and eSFR ISO 12233:2017 charts greatly reduces the amount of time needed to measure many image quality factors.
- ✓ Test Manager, Database, and Reports features allow companies to set up repeatable, comprehensive test plans and communicate relevant results.

Imatest IT

API for automated testing

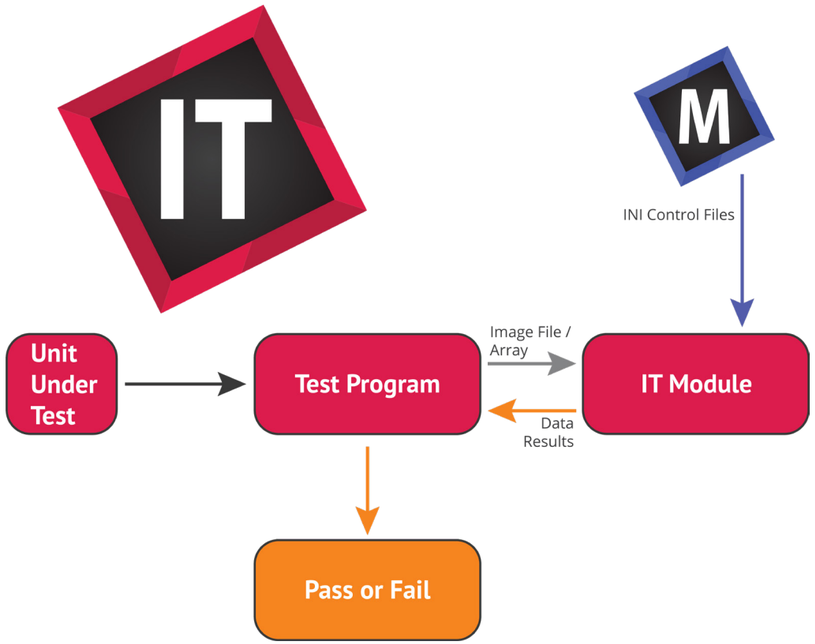
Why Choose IT?

Imatest Industrial Testing (IT) software integrates key Imatest Master modules as software components into an existing testing program. With Imatest IT, test results are consistent throughout the manufacturing process. Imatest IT also resolves potentially biased results generated by a supplier's in-house testing system by integrating the same specifications set during the design process.

> *"Imatest IT provides us with a gaugeable test platform from start to RMA [Return Merchandise Authorization]. We found that of all our camera module suppliers, those who follow our recommendation to use Imatest throughout their manufacturing process are the ones that perform the best."*

Camera Engineering Lead
Fortune 100 mobile device manufacturer

IT Testing Workflow



Highlighted Features

- ✓ Pass/Fail Specification lets you define required quality levels for a camera.
- ✓ SFRplus chart analysis allows for a complete map of sharpness non-uniformity, unlike many manufacturing tests that limit sharpness checks to the center and corners of an image.
- ✓ Even field test detects blemishes on the sensor, measures color and illumination non-uniformity, and identifies defective pixels.
- ✓ Calibrate signal processing with the results of color and illumination uniformity tests on each module and correct for the uniqueness in each camera.
- ✓ Maximize efficiency by completing camera quality-assurance tests with just three images: SFRplus chart, light even field, and dark even field.

Benefits of Imatest IT

- ✓ Detects problems early in the manufacturing process and prevents costly yield losses down the line by inspecting the sensor and lenses before completing the camera module and final device assembly
- ✓ Allows your business to safely balance fast production and product quality by automating processes that were performed manually
- ✓ Eliminates potentially biased results generated by a supplier's in-house testing system
- ✓ Prevents the need for correlation of supplier test results by using the same Imatest algorithm and charts in production as in R&D

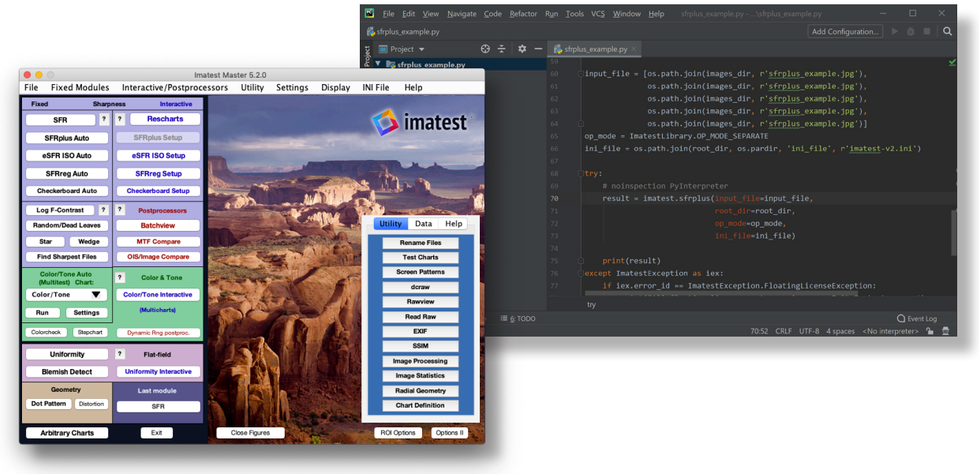
Integrates with production machines

Imatest Ultimate

Activating Imatest IT along with Imatest Master

Why Choose Ultimate?

Imatest Ultimate combines the analysis suite of Imatest Master and the automated testing of Imatest IT. This combination enables engineers to refine settings while integrating Imatest's software library with their factory or lab control systems without managing multiple licenses or computers. Imatest Ultimate offers our complete software capabilities within a single license.



Imatest Software	User Interface	Image Acquisition	Automation Library	Parallel Processing
Master	✓	✓		✓
IT		✓	✓	✓
Ultimate	✓	✓	✓	✓

Imatest License Information

Find the right tools for image quality testing

Subscription License

Subscription licenses offer many benefits including access to all updates during the subscription period, access to our technical support team, unlimited access to the Imatest training curriculum, and exclusive discount opportunities.

Perpetual License

New perpetual licenses include one year of support. Maintaining current support allows you access to all upgrades and updates during the support period, as well as access to our technical support team.

Node-Locked License

A node-locked license can be installed on multiple computers, but activated on just one computer at a time. A user must deactivate the license before it can be reactivated on a different computer. Note that a node-locked license can be upgraded to a floating license.

Floating License

A floating license is a flexible option offered with all Imatest license types. A floating license allows a set number of user "seats" to share the software across a number of computers. For example, a license purchased to allow four simultaneous activations can be installed on more than four computers, and it allows for easy transition of the four active users among installations.

Volume Discounts

We offer volume discounts to organizations that purchase five or more licenses in one order. Contact **sales@imatest.com** for details.

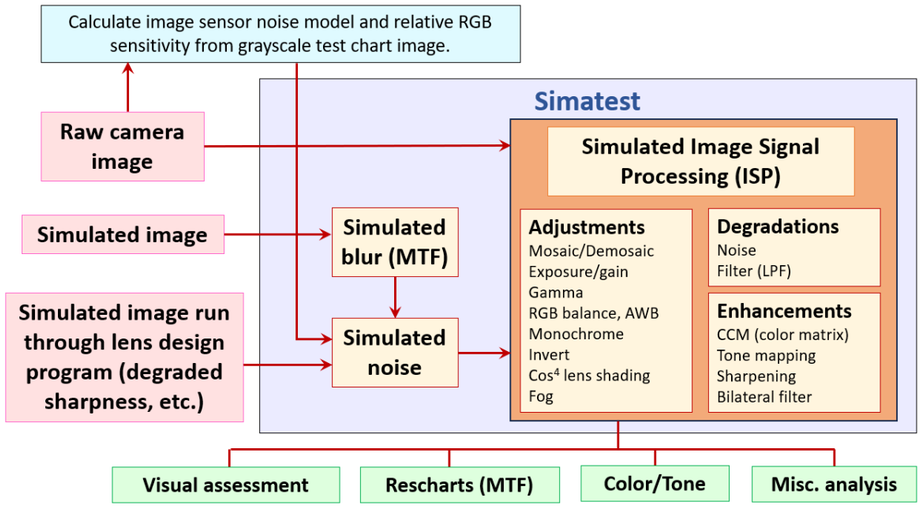
Simatest

Image Signal Processing (ISP) / camera simulator

Why Choose Simatest?

Simatest is a new feature in Imatest Master version 25.1. With Simatest, you can simulate ISP pipelines and complete camera systems. Simatest includes powerful and flexible processing blocks that can be applied in arbitrary order. Input includes raw camera images, simulated images, and images degraded by lens simulations. It has a powerful image sensor noise model, based on raw image measurements.

Use Simatest to speed up the development of your image processing pipelines.



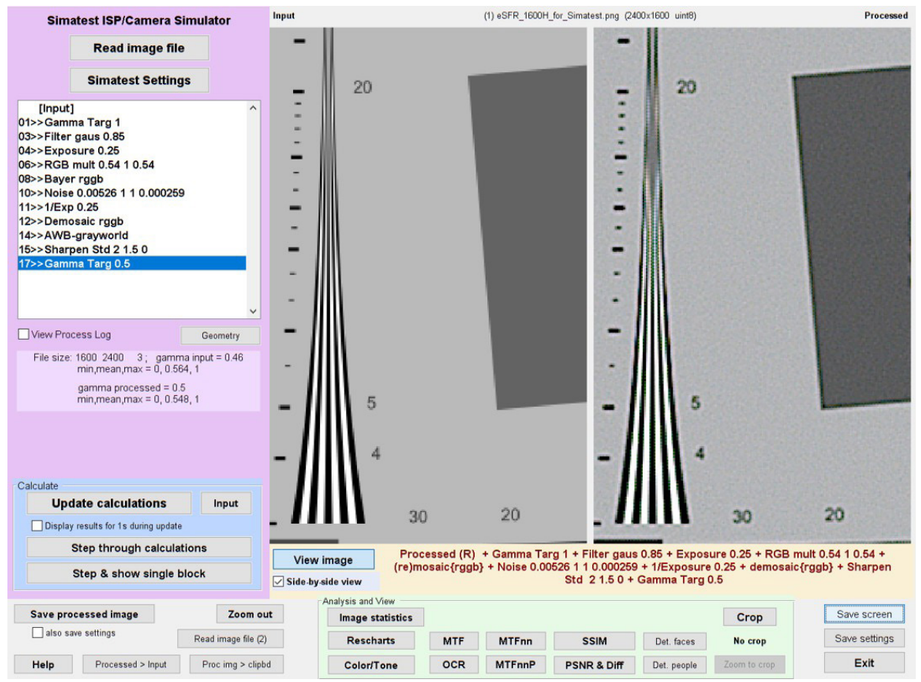
Simatest Processing Features

- ✓ ***Camera and lens image degradations*** such as noise, fog (veiling glare), and blur
- ✓ ***Image adjustments*** such as exposure and gain to simulate changing Exposure Index, gamma, and Bayer demosaicing/mosaicing
- ✓ ***Image enhancements*** such as applying a Color Correction Matrix, tone mapping (used in High Dynamic Range (HDR) imaging), sharpening & bilateral filtering
- ✓ ***Ability to simulate*** motion blur, low light conditions, misfocus, and more

Highlighted Features

- ✓ ***Simatest*** can operate on batches of images.
- ✓ ***Simatest output*** includes visual results for human vision and detailed quantitative analysis, including image information metrics, for machine vision.
- ✓ ***Simatest is expandable;*** processing blocks will be added based on customer requests. The initial processing blocks primarily affect visible and measurable image quality.

Example: The image below shows ideal and processed images for a compact digital camera. The processed image includes a gaussian filter to simulate lens blur, exposure adjustment, mosaicing/demosaicing, noise, sharpening, and a bilateral filter.



Simatest side-by-side view. Input image on left; processed on right (zoomed in).

Imatest Test Lab Services

Providing third-party objective image quality testing to meet your needs

Why Choose Imatest Test Lab Services?

Leave the IQ lab work to our image quality experts. Our engineers will test your devices using our hardware, charts, and software to analyze images and interpret results—saving you time and resources. Build a portfolio of reports with consistent, repeatable, and trustworthy results through rigorous testing protocols. You get all of the data, Imatest software plots, results files, and settings used to generate your results. We know that each test lab setup is unique to the needs of your company. Contact us today to speak with one of our engineers about your project.

Explore our Test Lab Service Offerings

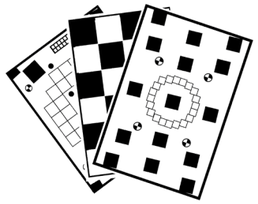
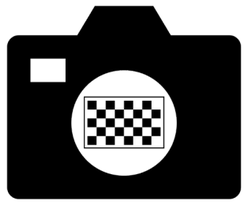
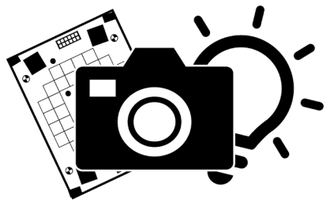


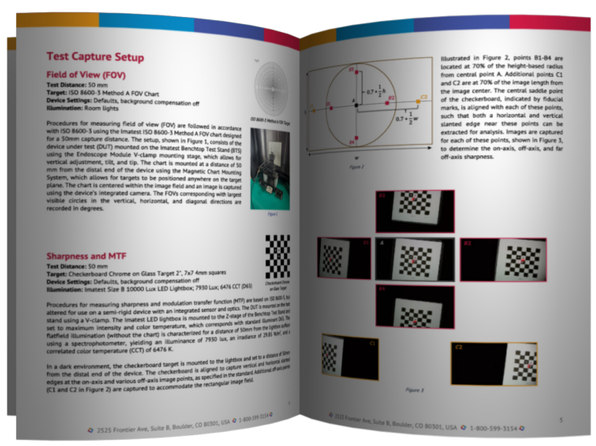
Chart-Based Testing

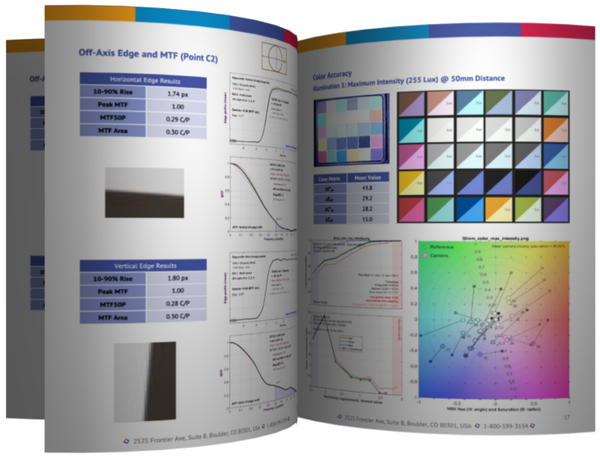


Advanced Testing



Customized Testing



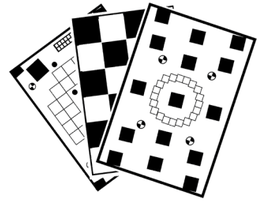


Example test report: commercial borescope image quality

Imatest Test Lab Services Offerings

Chart-Based Testing

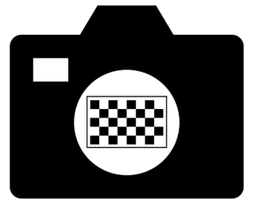
Choose from our most highly recommended charts, based on your application and metrics of interest



- ✓ ISO 12233:2024
- ✓ Checkerboard
- ✓ 36-Patch Dynamic Range
- ✓ Uniform Field
- ✓ Calibrite Color Checker

Advanced Testing

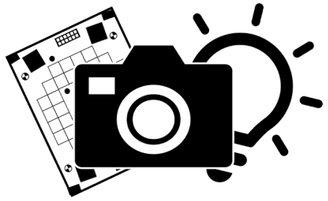
Advanced data collection and analyses to produce a full suite of results based on major image quality standards and Imatest recommendations



- ✓ ISO-24942 (EMVA 1288) Sensor Characterization
- ✓ Medical Device Evaluation
- ✓ Stray Light Evaluation

Customized Testing & Consulting

Fully customizable lighting, charts, setup, and device settings. We'll help you choose the best metrics and testing setup for your application and compile them into a custom report



- ✓ Alternative and custom test chart configurations
- ✓ Advanced device settings
- ✓ Advanced lighting
- ✓ Benchmarking
- ✓ Custom hardware
- ✓ Metric development
- ✓ Video testing

Imatest Chart Mounting

Professional mounting on flat, rigid substrates for reflective and transmissive test targets

Why Choose Imatest Chart Mounting?

Test charts must be mounted on a smooth, flat surface to avoid blemishes, bends, or bubbles for accurate image quality measurements. Imatest offers the option to professionally mount our test charts on rigid substrates including E-panel and acrylic. Mounting on your own, or even through a specialty print shop can lead to improper alignment or damage to your test charts. Imatest mounts each chart specifically to the size and alignment you need. No matter what size test chart you order, Imatest protects your shipment with professional, heavy duty packing materials to ensure that your mounted charts don't get damaged in transit. Magnetic backing options allow for easy swapping, alignment, and storage of mounted reflective targets.

Transmissive eSFR ISO mounted on clear acrylic

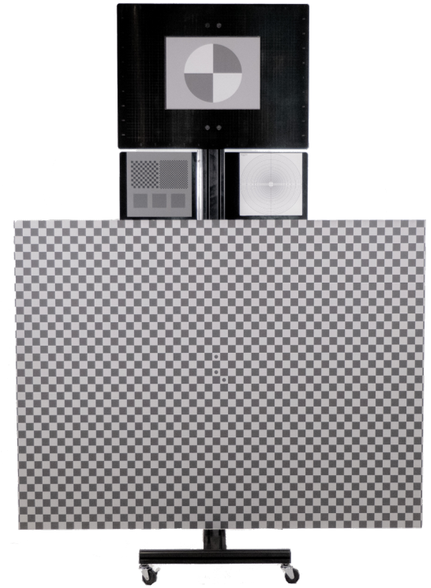
E-Panel Mounted Chart Specifications

Specifications	Details
Material:	2 thin layers of aluminum bonded on either side of a polyethylene (PE) core
Thickness:	6 mm (custom thicknesses available upon request)
Weight (6 mm Thickness):	6.39 kg/m^2 (1.31 lb/ft^2)
Maximum Chart Size:	1.12 m x 2.44 m (96" x 44")
Test Chart Substrates:	Reflective inkjet (semi-gloss or matte) and photographic targets
Optional Magnetic Backing:	0.4 mm (1/64") Thickness | 1.5 kg/m^2 (36 lb/ft^2) maximum pull strength

Acrylic Mounted & Framed Chart Specifications

Specifications	Details
Material:	Cast acrylic (clear or matte black)
Thickness:	6mm (Custom thicknesses available upon request)
Weight (6 mm Thickness):	6.93 kg/m^2 (1.42 lb/ft^2)
Standard Chart Sizes:	Imatest Light Boxes & Light Panels Sizes A-G (Custom sizes available upon request)
Test Chart Substrates:	Transmissive Inkjet, Color / B&W LVT Film, VisNIR, Chrome on Glass, Rez Checker / Color Gauge targets

Framed Chrome on Glass target on Imatest Light Box (Size B)



E-Panel mounted charts with magnetic backing on Imatest Freestanding Chart Holder

Training

Increase your knowledge of image quality testing

How Our Training Courses Work

You'll gain access to our recorded two-day training courses for three weeks. Our courses cover the factors contributing to image quality, how to select appropriate test charts, and how to use Imatest. Contact **training@imatest.com** for pricing on customized in-house training.

You will learn how to:

- ✓ Assess overall image quality.
- ✓ Measure key image quality factors using Imatest.
- ✓ Understand and interpret Imatest output.
- ✓ Avoid common mistakes in applying Imatest.
- ✓ Set up and tailor your test lab for accurate measurements.
- ✓ Select the appropriate test charts.
- ✓ Configure options to achieve particular testing objectives.
- ✓ Balance the trade-off between yield and end-user satisfaction.
- ✓ Automate tests for manufacturing quality control.

Consulting & Services

Get customized support for all of your imaging needs

How Can Our Experts Help You?

Imatest offers innovative solutions to address key issues in the design, development, and testing of imaging applications. We can adapt our algorithms to the characterization of unconventional imaging systems and optimize the efficiency of your testing procedures by maximizing the number of quality factors obtained from each test image. Imatest can also offer test lab services to test your device in our own world-class test lab.

For a major medical device company, Imatest developed software to remove honeycomb patterns introduced by fiberscopes and developed blemish detection algorithms and sofware.

Imatest developed custom test charts and procedures to assess the image quality of revolutionary new imaging systems for major medical device companies.

Experts Available in the Following:

- ✓ Imaging and color science
- ✓ Camera image quality/system characterization
- ✓ Digital signal processing/image enhancement pipeline
- ✓ Computer science
- ✓ Electrical engineering
- ✓ Physics
- ✓ Biomedical photography
- ✓ Camera calibration
- ✓ Remote sensing

Imatest integrated direct acquisition from development kits included in Imatest software for several image sensor manufacturers.

Imatest generated innovative infrared test charts designed to work in harsh physical environments for the US military.

Imatest constructed test methods and software to support quality control of night vision scopes for a supplier to the US military.

eSFR ISO Test Chart

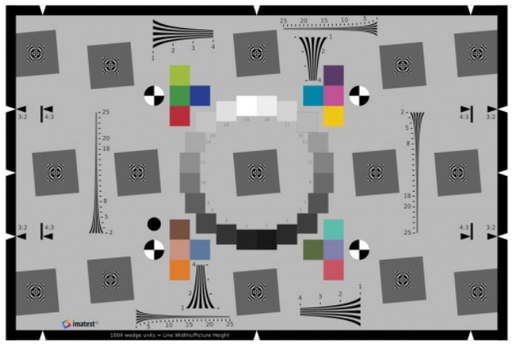
Perform highly automated measurements using the eSFR ISO Test Chart

Why Choose the Imatest eSFR ISO Test Chart?

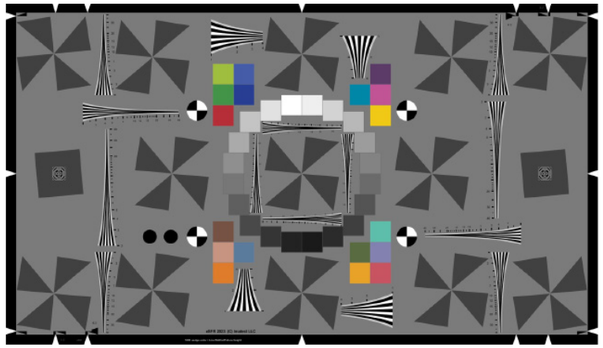
Imatest eSFR ISO charts are fully compliant with ISO 12233:2017 and 12233:2023. The multi-feature chart design allows for the measurement of several key image quality factors, including sharpness, chromatic aberration, distortion, noise, tonal response, color accuracy, ISO sensitivity, and limiting resolution. In addition, Imatest software automatically locates and analyzes all chart features, such as slanted-edges (or slanted stars), grayscale optoelectronic conversion function (OECF) patches, color patches, and wedges. Versions are available with hyperbolic edges that go up to 2500 or 4000 line widths per photo height as well as with extended and enhanced features.

Sizes

Our eSFR ISO charts can be printed in a variety of sizes to suit your testing needs. Custom charts are available upon request. Contact **sales@imatest.com** for custom-sizes.



Enhanced eSFR ISO 2017 chart



Extended eSFR ISO 2023 chart

eSFR ISO Test Chart Substrates

The Imatest eSFR ISO chart can be produced on a variety of substrates, including reflective inkjet (matte or semigloss), transmissive inkjet, photographic film, and chrome on glass. All inkjet charts are available in either visible or near-infrared and visible for testing cameras sensitive to wavelengths between 700 – 1000 nm.

Reflective

Iso Size	2017 ESFR Enhanced	2017 ESFR Extended	2023 ESFR Extended	MP Suitability*
1x	319.2 mm x 212.8 mm (12.6" x 8.4")	382.9 mm x 215.3 mm (15.1" x 8.5")	372.8 mm x 215.3 mm (14.7" x 8.5")	Inkjet: 1.6 MP
2x	638.3 mm x 425.5 mm (25.1" x 16.8")	765.4 mm x 430.4 mm (30.1" x 16.9")	745.1 mm x 430.4 mm (29.3" x 16.9")	Inkjet: 6.2 MP
4x	1276.6 mm x 851.1 mm (50.3" x 33.5")	1513 mm x 850.8 mm (59.6" x 33.5")	1472.9 mm x 850.8 mm (58" x 33.5")	Inkjet: 24.9 MP

Transmissive

Light Source Size	Mounted Size	2017 ESFR Active Area	2023 ESFR Active Area	MP Suitability*
A	253 mm x 174 mm (9.96" x 6.85")	228 mm x 152 mm (8.98" x 5.98")		Color film: 18.8 MP Black & white film: 5.9 MP
B	318 mm x 290 mm (12.52" x 11.42")	235 mm x 157 mm (9.25" x 6.18")		Color film: 20.1 MP Black & white film: 6.2 MP
C	456 mm x 327 mm (17.95" x 12.87")	432 mm x 288 mm (17.01" x 11.34")		Transmissive inkjet: 3.2 MP Black & white film: 21.1 MP
D	634 mm x 454 mm (24.96" x 17.87")	610 mm x 407 mm (24.02" x 16.02")		Transmissive inkjet: 6.3 MP
E	931 mm x 562 mm (36.65" x 22.13")	907 mm x 510 mm (35.71" x 20.08")	907 mm x 524 mm (35.71" x 20.63")	Transmissive inkjet: 11.8 MP
F	931 mm x 702 mm (36.65" x 27.64")	907 mm x 605 mm (35.71" x 23.82")		Transmissive inkjet: 14.0 MP
G	1253 mm x 706 mm (49.33" x 27.79")	1210 mm x 680 mm (47.64" x 26.77")	1177 mm x 680 mm (46.35" x 26.77")	Transmissive inkjet: 21.0 MP

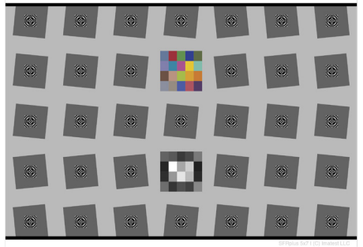
** Megapixel suitability can be approximately doubled through the use of Chart MTF compensation. For higher resolution systems, please consider our chrome on glass eSFR ISO Targets.*

Size A & B will be framed with 6 mm black acrylic. Size C, D, E, F, & G will be directly mounted to 6 mm clear acrylic.

SFRplus Test Chart

Imatest's efficient slanted edge test charts

Why Choose the Imatest SFRplus Test Chart?

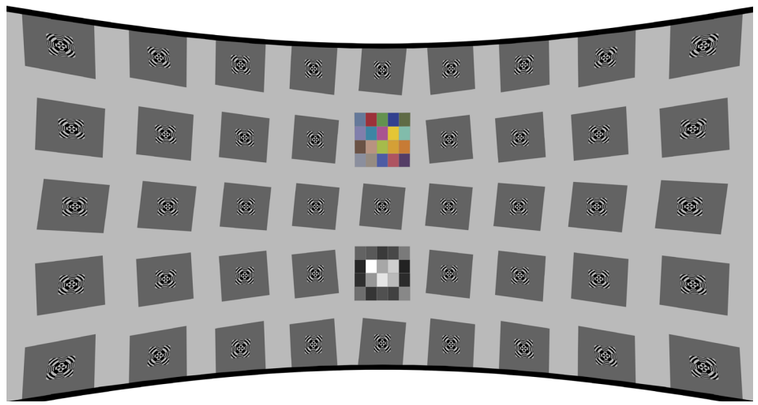


SFRplus test chart (5x7) with 4:1 contrast

The Imatest SFRplus chart provides a highly detailed and comprehensive map of sharpness over an imaging system's field of view (FOV). SFRplus can be used for a wide range of testing scenarios, including systems with fish eye lenses, such as automotive imaging systems. SFRplus is available in standard planar, predistorted, and microscopic sizes, and can be printed on a variety of substrates. The chart is offered in multiple contrast ratios: 4:1, which meets the ISO 12333:2017+ standard; 10:1; two-toned 10:1; and 2:1.

Sizes and Substrates

We offer the SFRplus chart on a variety of substrates and sizes including transmissive, reflective, high-precision, long, mid, and near wave infrared, LVT film (color and black and white), and chrome on glass.



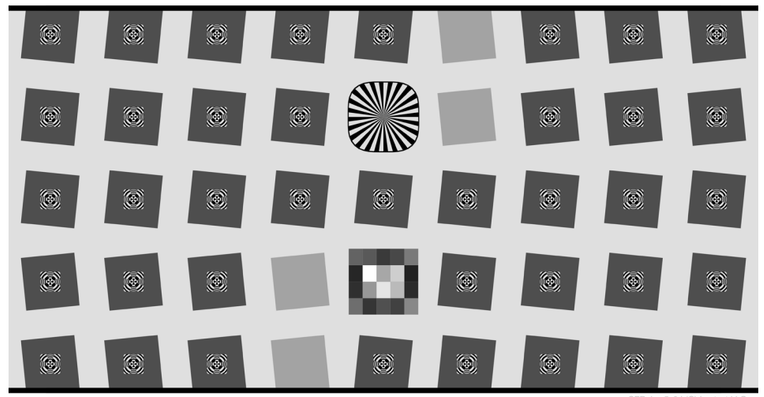
Predistorted SFRplus test chart (5x9) with 4:1 contrast

SFRplus Sizes & Substrates

Substrate	Active Area (5x7 squares)	Active Area (5x9 squares)
Inkjet (XS)	16.33 cm x 22.86 cm (6.429″ x 9″)	19.76 cm x 35.56 cm (7.778″ x 14″)
Inkjet (S)	34.47 cm x 48.26 cm (13.571″ x 19″)	32.46 cm x 58.42 cm (12.778″ x 23″)
Inkjet (M)	59.87 cm x 83.82 cm (23.571″ x 33″)	55.03 cm x 99.06 cm (21.667″ x 39″)
Inkjet (L)	107.04 cm x 149.86 cm (42.143″ x 59″)	83.26 cm x 149.86 cm (32.778″ x 59″)
Inkjet (XL)	110.74 cm x 160.02 cm (43.6″ x 63″)	103.01 cm x 185.42 cm (40.556″ x 73″)
Color LVT Film	23.5 cm x 13.05 cm (9.25″ × 5.139″)	235 mm × 131 mm (9.25″ × 5.139″) *Multisize**
Black and White LVT Film	38.04 cm x 26.81 cm (14.96″ x 10.56″)	48.3 cm x 26.81 cm (19″ x 10.56″)
Chrome on Glass (2″)	3 cm × 4.2 cm (1.18″ x 1.65″)	2 cm × 3.6 cm (.79″ x 1.42″)
Chrome on Glass (4″)	8.36 cm × 11.7 cm (3.29″ x 4.6″)	6 cm × 10.8 cm (2.36″ x 4.25″)
Chrome on Glass (slide)	--	2.54 cm x 7.62 cm (1″ x 3″) multislide *(Includes five patterns)*

**Smaller multisize charts are available.*

Additional sizes are available to those listed in the above chart. See our website for a complete listing of sizes. Contact us at **charts@imatest.com** for customization or assistance selecting a chart for your testing needs.



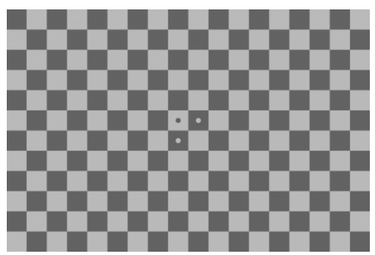
SFRplus test chart (5x9) with 10:1 and 2:1 contrast

Checkerboard Test Chart

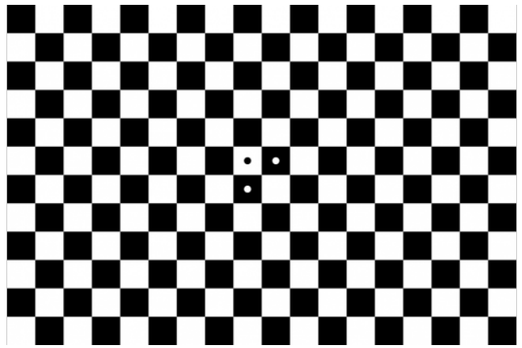
Imatest's recommended chart for measuring distortion

Why Choose Imatest Checkerboard Test Chart?

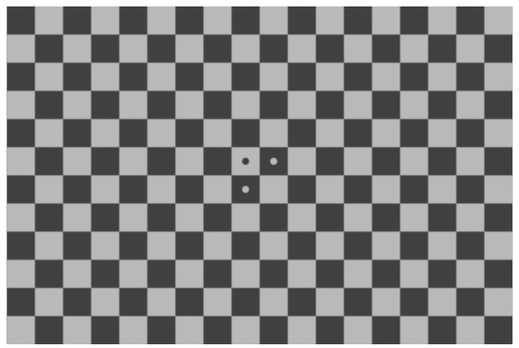
Imatest's highly versatile checkerboard test chart works over a wide range of testing distances. It is available in a variety of substrates, including those that are reflective, transmissive, high-precision, and NIR-capable. The checkerboard design offers high-density SFR measurements as well as high-accuracy distortion characterization of any system. Select sizes ranging from microscopic to over one meter in size, or have us create a custom size for your needs.



4:1 contrast ratio
(ISO 12233 standard contrast)



45:1 contrast ratio



10:1 contrast ratio

Checkerboard Sizes & Substrates

Inkjet

Size	Active Area	Megapixel Suitability*
X-Small	20.07 cm x 30.1 cm (7.9" x 11.85")	3.1 MP
Small	39.12 cm x 58.67 cm (15.4" x 23.1")	5.9 MP
Medium	59.44 cm x 89.15 cm (23.4" x 35.1")	14.3 MP
Large	110.24 cm x 165.35 cm (43.4" x 65.1")	28.1 MP

Photographic Matte

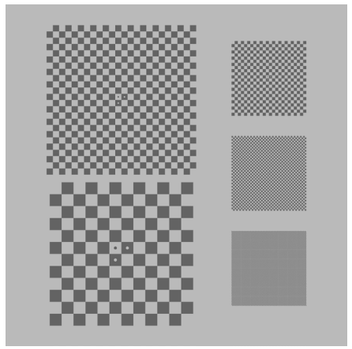
Pattern	Square Size	Active Area	Megapixel Suitability
Multi Size	0.5 mm, 1 mm, 2 mm 4 mm 8 mm	50 x 50 mm (1.97" x 1.97") 100 x 100 mm (3.94" x 3.94") 96 x 96 mm (3.78" x 3.78")	0.7 MP 2.8 MP 2.5 MP
18 mm	18 mm	216 x 216 mm (8.50" x 8.50")	12.9 MP

Chrome on Glass

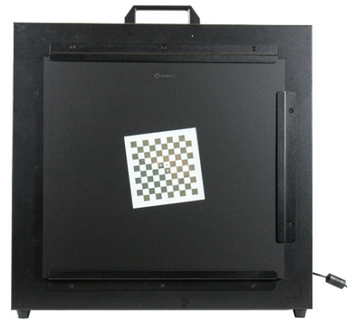
Plate Size	Square Layout	Megapixel Suitability
25.4 mm x 76.2 mm (1" x 3")	10 x 20, 20 x 20, and 40 x 40	10+ MP
50.8 mm x 58 mm (2" x 2")	7 x 7, 15 x 15, or 30 x 30	25+ MP
101.6 mm x 101.6 mm (4" x 4")	10 x 10 or 30 x 30	50+ MP

** Megapixel suitability can be approximately doubled through the use of chart MTF compensation.*

Custom sizes available upon request



Multi-size checkerboard
On photographic matte



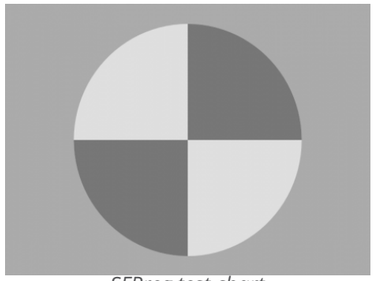
4" x 4" chrome on glass
Imatest LED Lightbox, Size B

SFRreg Test Chart

Accurately measure MTF and lateral chromatic aberration

Why Choose the Imatest SFRreg Test Chart?

SFRreg charts provide slanted edges for sharpness and lateral chromatic aberration measurements. Place SFRreg charts at arbitrary positions and angles to accommodate a wide variety of test cases, including long distance and ultrawide field of view (FoV). Where a large planar target cannot practically fill the FoV, multiple SFRreg charts can be placed throughout the field to test focus with a single image.



SFRreg test chart

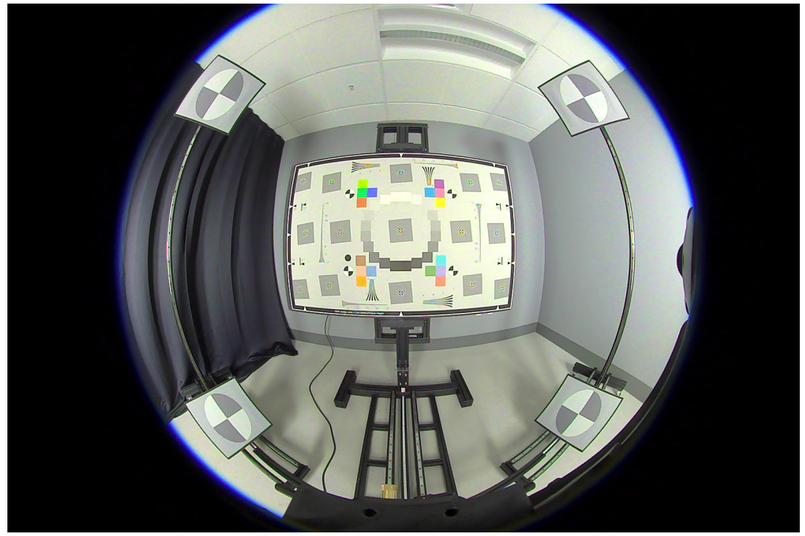
Sizes and Substrates

We offer a range of sizes to suit your testing needs. Charts can be rotated to the ISO standard 5° tilt angle or to align with sagittal and tangential directions in a radial field. Several contrast ratios are available including 4:1 (ISO Standard) and 10:1. Available substrates include reflective, transmissive, and high-precision film targets. Circular versions of the target can be installed in target projection collimators to simulate long distance. Contact **sales@imatest.com** for assistance to determine the chart that will work best for your test setup.

Modular Test Stand with Wide Field-of-View Module

SFRreg Sizes & Substrates

Size	Substrate	Reg Mark Diameter	Active Area
.5x	**Inkjet**	100 mm (3.94″)	125 mm x 165 mm (4.92″ x 6.50″)
1x	**Inkjet**	200 mm (7.87″)	250 mm x 330 mm (9.84″ x 12.99″)
1.5x	**Inkjet**	300 mm (11.81″)	375 mm x 500 mm (14.76″ x 19.69″)
2x	**Inkjet**	400 mm (15.75″)	500 mm x 665 mm (19.69″ x 26.18″)
3x	**Inkjet**	600 mm (23.62″)	750 mm x 1000 mm (29.53″ x 39.44″)
4x	**Inkjet**	800 mm (31.50″)	1000 mm x 1330 mm (39.37″ x 52.36″)
5x	**Inkjet**	1000 mm (39.37″)	1105 mm x 1665 mm (43.50″ x 65.55″)
1 Reg Mark	**Film**	157.88 mm (6.22″)	196.85 mm x 234.95 mm (7.75″ x 9.25″)
2 Reg Marks	**Film**	93.84 mm (3.69″)	117.0 mm x 156.0 mm (4.61″ x 6.14″)
4 Reg Marks	**Film**	70.66 mm (2.78″)	88.11 mm x 117.48 mm (3.47″ x 4.63″)
6 Reg Marks	**Film**	59.20 mm (2.33″)	73.82 mm x 98.43 mm (2.91″ x 3.88″)
12 Reg Marks	**Film**	39.34 mm (1.55″)	49.06 mm x 65.41 mm (1.93″ x 2.58″)



Example of SFRreg test chart arrangement for wide field-of-view

Dynamic Range Charts

Charts for testing tonal response, noise, and dynamic range

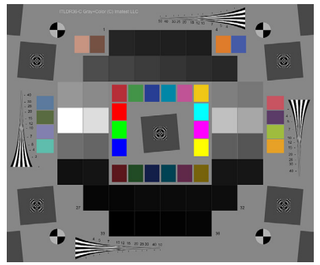
Why Choose Imatest Dynamic Range Charts?

Imatest Dynamic Range test charts are available in a variety of density ranges and styles. These charts allow you to measure the tonal response, noise, and dynamic range of imaging systems with a single image. Each chart includes a ~15% transmission background that enables proper exposure in auto-exposure cameras. The optional DarkWorld mask reduces flare light and produces higher dynamic range measurements by simulating a night-time scene. The VisNIR Film versions allow for stable attenuation across visible and near-infrared wavelengths. Version 2 of the target was released in October, 2025 and is supported by Imatest 25.2. V2 includes additional color patches, a new patch order that reduces the impact of ghost image stray light, and logarithmic wedges that can be used for measuring limiting resolution.

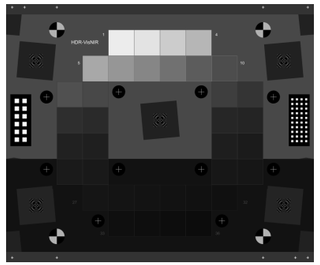
Low Dynamic Range (ITLDR)

Wide Dynamic Range (ITWDR)

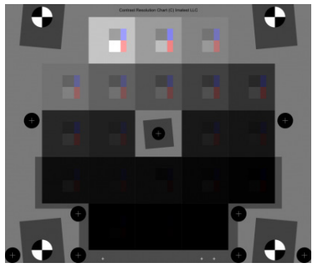
Ultra-High Dynamic Range (ITUHDR)



Low Dynamic Range - V2 (ITLDR36-V2)



VisNIR Ultra-High Dynamic Range (VISNIR-UHDR)



Contrast Resolution Chart (ITCRC)

Dynamic Range Sizes & Substrates

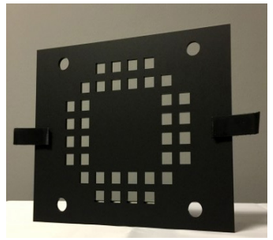
Charts	Density	Aspect Ratio	Camera Types
Low Dynamic Range (ITLDR36)	50 dB	4:5, 16:9	Small pixel cameras like camera phones or tablets
Wide Dynamic Range (ITWDR36)	100 dB	4:5	High-quality cameras like DSLRs and non-HDR devices
Ultra-High Dynamic Range (ITUHDR36)	150 dB	4:5	High dynamic range (HDR) cameras
Contrast Resolution Chart (ITCRC)	100 dB	4:5	Black box cameras with tone mapping and noise reduction
VisNIR Low Dynamic Range (VISNIR-LDR36)	80 dB	4:5	Near-infrared (300 nm-1000 nm spectral range)
VisNIR Ultra-High Dynamic Range (VISNIR-UHDR36)	160 dB	4:5	Near-infrared (300 nm-1000 nm spectral range)
Low Dynamic Range - Version 2 (ITLDR36-V2)	50 dB	4:5	V2 Changes: new patch order that reduces the impact of ghost image stray light, additional color patches, and logarithmic wedges that can be used for measuring limiting resolution.
Wide Dynamic Range - Version 2 (ITWDR36-V2)	100 dB	4:5	
Ultra-High Dynamic Range - Version 2 (ITUHDR36-V2)	150 dB	4:5	

Imatest recommends using Dynamic Range Charts with a high illuminance light source (between 10,000 and 100,000 LUX) in order to provide sufficient light to test image sensors over their range of sensitivity. Both visible and near-infrared light sources are available.

Standard Compliance

The Ultra-High Dynamic Range (ITUHDR) chart combined with the Imatest DarkWorld Mask and illuminated by a 100,000 LUX LED Light Box is compliant with target definitions in IEC 62676-5.

10,000-100,000 LUX LED Lightbox



Imatest DarkWorld Mask

Diverse Skin Tone Face Targets

Inclusive representation for equitable camera calibration & color accuracy

Why Choose Imatest Diverse Skin Tone Face Targets?

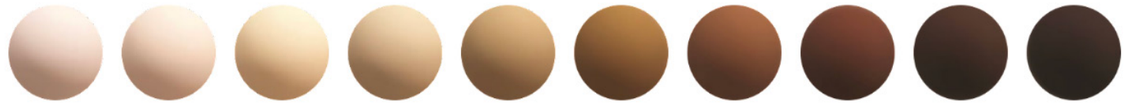
Our set of 10 skin tone face charts is designed to help evaluate how imaging systems reproduce a diverse range of human appearances. They are inspired by the Monk Skin Tone (MST) Scale, which includes 10 tones, developed by Harvard sociologist Dr. Ellis Monk, and used by Google to promote fairness in AI and imaging. These charts provide a practical tool for testing cameras and processing pipelines across a representative span of skin tones.

Unlike simple patches, our charts feature full simulated human faces. This matters because modern imaging pipelines often prioritize faces when making exposure and color decisions. Many auto-exposure (AE) and auto-white balance (AWB) algorithms rely on face detection as a key signal: the detected skin region is used to guide brightness, contrast, and color rendering. If faces are not detected reliably—or if skin tone distribution is not handled fairly—algorithms may incorrectly shift exposure or color balance, resulting in inaccurate reproduction.

IMDSTFT-SET-V2

Diverse Skin Tone Face Target Specifications

Specifications	Details
Targets	Monk 1 (lightest) - Monk 10 (darkest)
SKU	IMDSTFT-SET-v2
Printing Process	Inkjet
Media	Matte paper
Size	254 mm x 254 mm (10" x 10")
Optional Mounting	6 mm ePanel | Magnetic backing optional
Weight (Mounted)	Set of 10: 4.54 kg (10 lb) | Individual: 0.45 kg (1 lb)



Uniform Reflectance Targets

Lambertian flatfield targets for white balance, color, and uniformity testing

Why Choose Imatest Uniform Reflectance Targets?

These targets provide spectrally neutral and diffuse Lambertian reflectance for camera uniformity testing. These targets are available in a range of sizes for close and medium-range applications.

Validate endoscope illuminator uniformity with a NIST-calibrated reflectance target and Imatest flatfield analysis.

Large 18% and 70% reflectance targets can be combined with a color test chart to provide a consistent background for white balance, chroma level, and color uniformity testing.

LIDAR reflectance targets are available in 5% – 95% reflectivity across wide spectrum UV-VIS-NIR.

NIST Calibrated Reflectance Targets

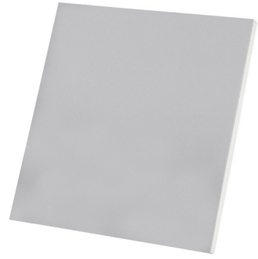
Zenith Lite™ Diffuse Reflectance LiDAR Test Targets

70% and 18% Gray Reflectance Targets

Imatest Uniform Reflectance Target Offerings

NIST Calibrated Reflectance Targets

Designed for minimized speckle with built-in illumination, making it ideal for close-range medical applications. Comes mounted on 6 mm thick dibond.



- ✓ NIST calibrated
- ✓ Reflectance: 18% or 80%
- ✓ Size: 150 x 150 mm (~6” x 6”)
- ✓ Thickness: 6 mm

Zenith Lite™ Diffuse Reflectance LiDAR Test Targets

The ideal choice for both laboratory and field applications. Zenith targets are lightweight and can withstand harsh environments for long exposure periods. Diffuse Lambertian reflectance for wavelengths from 250 nm to 2500 nm.

- ✓ NIST Traceable Spectral Calibration Certificate Optional
- ✓ Reflectance: 5% – 95%
- ✓ Sizes: 200 x 200 mm (~8” x 8”)
- ✓ 300 x 300 mm (~12” x 12”)
- ✓ 500 x 500 mm (~20” x 20”)
- ✓ Thickness: 11 mm

70% and 18% Gray Reflectance Targets

Standard 70% and 18% gray targets for ISO16505 testing. Optional mounting on 6mm ePanel.

- ✓ ISO16505 Compliant
- ✓ Reflectance: 70% or 18%
- ✓ Size: 914.4 mm x 610 mm (36” x 24”)
- ✓ Optional Mounting on 6 mm ePanel

Long Wave Infrared Test Charts

Thermal targets for LWIR resolution testing

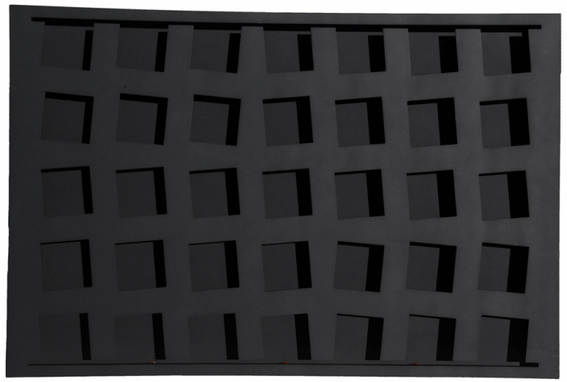
Why Choose the Imatest Long Wave Infrared Test Charts?

Imatest's Long Wave Infrared (LWIR) Test Charts act as black body emitters, designed for testing the resolution of thermal imaging systems. The back plate is uniformly heated with a silicone heating blanket, and the thermally isolated front plate stays near the ambient temperature of your testing environment. In combination with the Imatest Master software package, LWIR targets allow you to test the MTF (sharpness) of your thermal imaging system using an adjustable heating differential between the two aluminum plates. They are available in a variety of test chart patterns, including single slanted edge, SFRplus, and custom.

Imatest Long Wave Infrared Test Charts Features

- ✓ Large chart size: charts measure 61cm (24.02") high by 91.5 cm (36.02") wide, with a sturdy aluminum substrate and integrated silicone heating blanket
- ✓ Support for a wide range of IR wavelengths: the uniformly heated back plate acts as an emissive black body, while the thermally isolated front plate delivers high thermal contrast
- ✓ SFRplus pattern: features smaller slanted edges across the entire test chart, enabling variations in sharpness to be accurately and objectively measured across the field of view
- ✓ Single slanted edge pattern: provides a larger ROI, which enables longer test distances

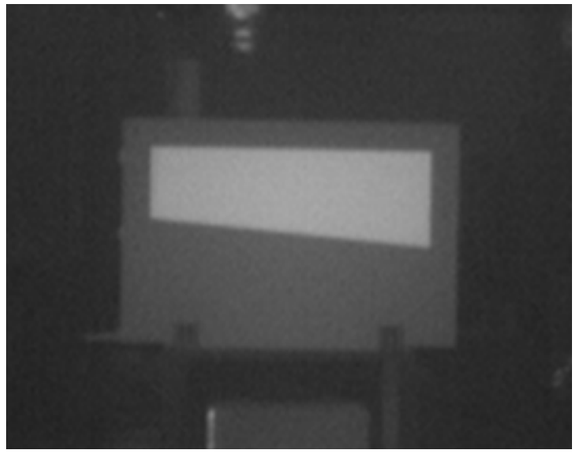
LWIR-Reg-L



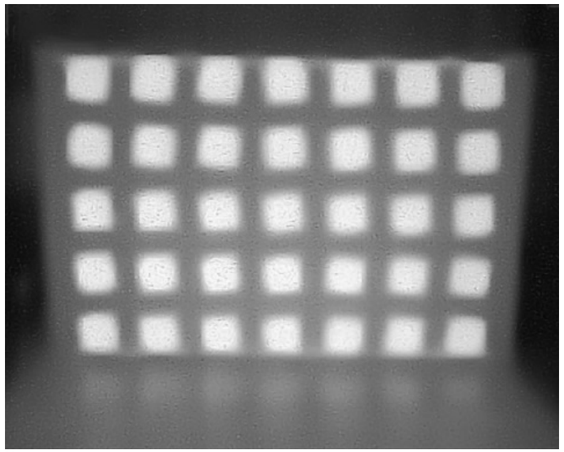
SPLWIR-M

Long Wave Infrared Test Charts Specifications

Specifications	Details
LWIR-Reg-L Weight:	17.12 kg (37.75 lb)
SPLWIR-M Weight:	15.76 kg (34.75 lb)
LWIR-Reg-L Shipping Weight:	24.9 kg (55 lb)
SPLWIR-M Shipping Weight:	23.59 kg (52 lb)
Dimensions:	915 mm x 610 mm x 107 mm (36" x 24" x 4.21")
Shipping Dimensions:	990 mm x 680 mm x 220 mm (39" x 27" x 9")
Maximum Temperature Difference:	~20°C (~36°F)
Substrate Material:	Powder coated aluminum, silicone heating blanket
Warm-Up Time:	25-30 minutes
Voltage:	120 VAC (240 VAC version also available upon request)
Power:	1080 W
Temperature Control:	Adjustable thermostat controller



LWIR-Reg-L



SPLWIR-M

Field Ruggedized Target & Stand

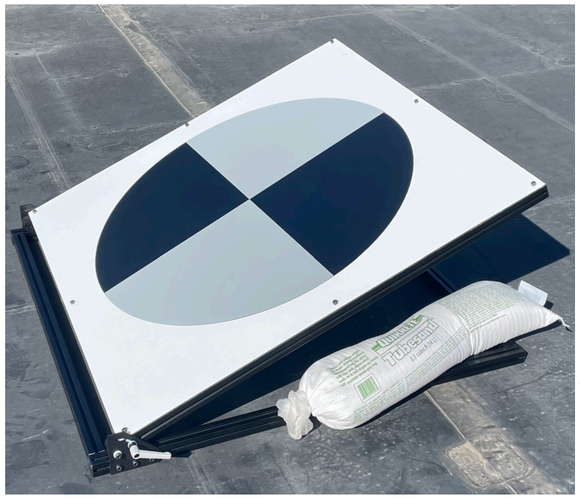
High stress SFRreg target for field testing

Why Choose the Imatest SFRreg Field Ruggedized Target?

The SFRreg Field Ruggedized Target allows you to test your cameras and equipment in real world applications. This target is ideal for testing UAVs, drones, agricultural equipment, weather stations, and more in outdoor environments. With the Field Ruggedized SFRreg Target, you can test for resolution or sharpness in outdoor lighting conditions and compare your results measured in a controlled lab environment. This target is UV and water resistant for the most extreme outdoor conditions.

Imatest SFRreg Field Ruggedized Target Features

- ✓ Matte Vinyl substrate: operate in temperature ranges from -50°F to 180°F
- ✓ Recommended uses: Automotive, Architectural, Marine (above static water line)
- ✓ Mounted to 6 mm ePanel dibond
- ✓ Optional M8 through holes for mounting to a wall or frame
- ✓ Contrast Ratio of 4 (± 1.5) : 1
- ✓ UV and Water resistant
- ✓ Sturdy aluminum frame: adjustable angle from 0° to 90°

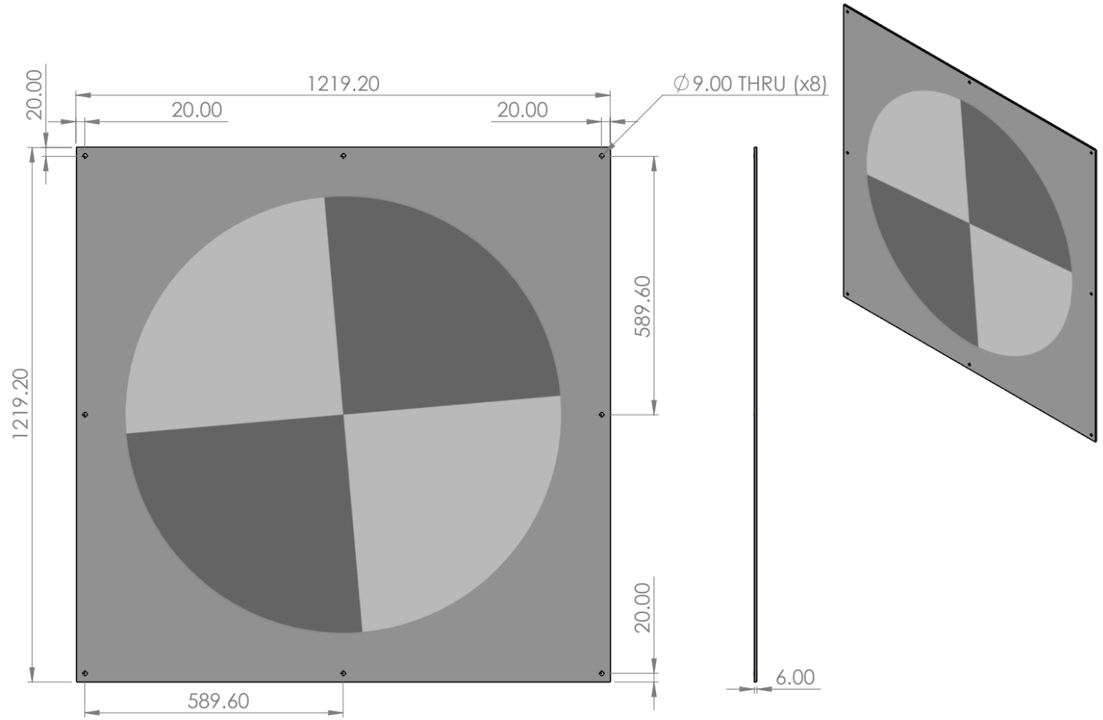


REG-FR-5x with REG-FR-5x-STAND

REG-FR-5x-STAND

SFRreg Field Ruggedized Target Specifications

Specifications	Details
REG-FR-5x Weight:	9.5 kg (21 lb)
REG-FR-5x Dimensions:	1219.2 mm x 1219.2 mm x 6 mm (48" x 48" x 0.24")
SFRreg Diameter:	1000 mm (39.37") (SFRreg size 5x)
Temperature Range:	-50° F to 180° F (-60° C to 107° C)
Substrate Material:	Supreme wrap matte vinyl
Contrast Ratio:	4 (± 1.5) : 1
Recommended Uses:	UAV, automotive, architectural, marine (above static water line)
SFRreg Tilt:	5°
REG-FR-5x-STAND Weight:	15.5 kg (34.17 lb)
REG-FR-5x-STAND Dimensions:	1347 mm x 1300 mm x 120 mm (53" x 51.2" x 4.72")
REG-FR-5x-STAND Adjustment Range:	0° – 90°



REG-FR-5x (with M8 mounting holes) – units in mm

Imatest LED Light Panel

A versatile, low-profile, uniform light source

Why Choose Imatest LED Light Panel?

The Imatest LED Light Panel is a versatile, low-profile and lightweight light source with dimmability, 90% uniformity, wireless controls, and easy integration with our hardware and charts.

Choose from a variety of color temperatures as well as near-infrared channels with illuminance levels ranging from Visble: 100 – 1,000 LUX and NIR: 2 – 20 W/m^2. The LED Light Panel is ideal for testing many image quality factors with a range of transmissive test charts.

Light Panel with eSFR ISO Chart

The light panels are offered in seven standard sizes with:

- ✓ Chart alignment rails align charts for the most reliable results.
- ✓ Choose from four visible and two NIR illuminant options (single channel).
- ✓ Illuminance levels range from Visible: 100 – 1,000 LUX; NIR: 2 – 20 W/m^2.
- ✓ 90% uniformity standard.

Low-profile

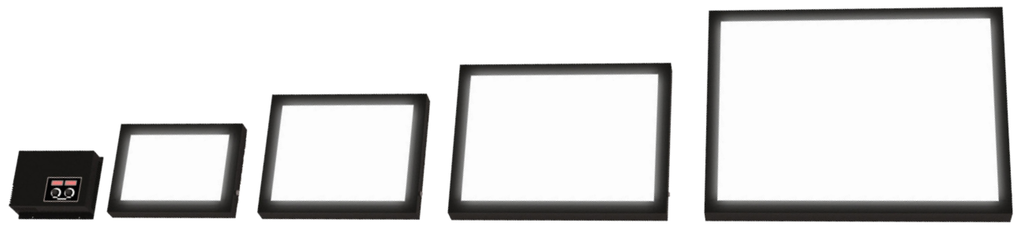
Wireless control box

Sizes & Intensities

Size	Diffuser Panel Size/ External Dimensions	Intensity (min to max)	Light Temperature Options	Uniformity	Channels
A	229 mm x 152 mm (9″ x 6″) 299 mm x 222 mm x 40 mm (11.8″ x 8.7″ x 1.6″)	Visible: 100 – 1,000 LUX NIR: 2 – 20 W/m^2	3100K 4100K 5100K 6500K NIR 850nm NIR 940nm	90%	Single
B	260 mm x 220 mm (10.24″ x 8.66″) 384 mm x 334 mm x 60 mm (15.1″ x 13.1″ x 2.4″)				
C	43 2mm x 305 mm (17″ x 12″) 512 mm x 385 mm x 60 mm (20.2″ x 15.2″ x 2.4″)				
D	610 mm x 432 mm (24″ x 17″) 690 mm x 512 mm x 60 mm (27.2″ x 20.2″ x 2.4″)				
E	907 mm x 540 mm (35.7″ x 21.3″) 987 mm x 620 mm x 70 mm (38.9″ x 24.4″ x 2.8″)	Visible: 30 – 1,000 LUX NIR: 2 – 20 W/m^2			
F	907 mm x 680 mm (35.7″ x 26.8″) 987 mm x 760 mm x 70 mm (38.9″ x 29.9″ x 2.8″)				
G	1225 mm x 680 mm (48.2″ x 26.8″) 1305 mm x 760 mm x 70 mm (51.4″ x 29.9″ x 2.8″)				

Power Controls

- ✓ 20 W
- ✓ 110 V
- ✓ 220 V
- ✓ Manual
- ✓ USB
- ✓ WiFi



Control box & sizes A-D

Imatest LED Lightbox

Designed for dynamic range and high resolution testing

Why Choose the Imatest LED Lightbox?

The Imatest LED Lightbox produces uniform light with excellent spectral characteristics that can be adjusted over a wide range of brightness for illuminating transparency test charts. Lightboxes include wireless control, chart rails for repeatable alignment, and mounting holes for integrating with test fixtures. Choose from a range of color temperatures and near-infrared channels.

Ultra-High Illumination Flickering Lightboxes can be used for camera flicker response testing. This lightbox is brighter than direct sunlight, and is offered at a fixed 5100 K color temperature.

Standard LED Lightbox Features

- ✓ Multi (dual) channel with mixed mode
- ✓ Standard intensity levels: Visible: 30 – 10,000 LUX (or ~150,000 LUX); NIR: 2 – 20 W/m^2
- ✓ Size B: 95% uniformity | Size C: 93% uniformity (90% for NIR options)

Ultra-High Illumination Flickering LED Lightbox Features

- ✓ Flicker testing for IEEE P2020 testing of camera LED Flicker Mitigation (LFM)
- ✓ Luminance of 10 to 47,700 cd/m2 (30 to 150,000 LUX)
- ✓ Single visible channel: 5100 K color temperature

ILB-B-3100-6500

ILB-B-150K (Ultra-High Illumination Flickering)

Sizes & Intensities

Size	Diffuser Panel Size/ External Dimensions	Intensity (Min to Max)	Uniformity	LED Color Temperature & NIR Wavelengths
B	Dual Channel: 260 mm x 220 mm (10.24″ x 8.66″) 400 mm x 380 mm x 150 mm (15.7″ x 15″ x 7.9″) Ultra-High Illumination Flickering*: 300 mm x 280 mm (11.8" x 11.0") 440 mm x 415 mm x 159 mm (17" x 16" x 6")	Visible: 30 – 10,000 LUX 30 – 100,000 LUX 30 – 150,000 LUX NIR: 2 – 20 W/m^2	Visible: 95% NIR: 90%	5100 K** 3100 K & 6500 K*** 5100 K & 850 nm 850 nm & 940 nm 5100 K & 940 nm
C	432 mm x 305 mm (17″ x 12″) 600 mm x 490 mm x 150 mm (23.6″ x 19.3″ x 7.9″)	Visible: 30 – 10,000 LUX NIR: 2 – 20 W/m^2	Visible: 93% NIR: 90%	

** Adjustable Flickering Frequency: 10 – 65000 Hz, with 0 – 100% duty cycle*
*** Ultra-High Illumination Flickering LED Lightbox only available in single visible channel: 5100K color temperature.*
**** Mixed mode allows you to achieve color temperatures within the dual channel range. In mixed mode, min intensity increases to 200 LUX.*

Power & Controls

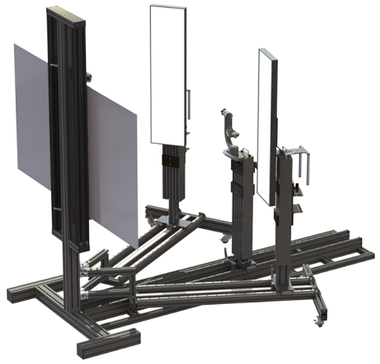
Specifications	Details
Controls	Manual | USB Serial | WiFi
Power	Standard: 20 W | Ultra-High Illumination Flickering: 750 W
Input Voltage	110 V | 220 V

ILB-B-3100-6500 with ITUHDR Target

ILB-B-150K (Ultra-High Illumination Flickering)

Reflective Lighting

Uniform lighting for reflective test charts



Specifications	Kino Flo Freestyle 31 LED	Metaphase NIR ExoLight
Color temperature/ Wavelength range	CCT: 2700 – 6500 K Extended color range: 2500 – 9900 K	850 nm or 940 nm
Spectral Tunability	N/A	N/A
Illuminant type	LED	LED
Dimensions	Two 102 x 28 x 9 cm panels, can be mounted on 76 cm Kino Flo stands or the Modular Test Stand Reflective Module	Two 94 x 8 x 7 cm bars
Control options	External control box or USB DMX controller	External control box or USB serial connection
Lighting Control Compatibility	Yes	Yes

Thouslite LEDCube	IQL SpectriWave Lighting System
CCT: 2000 – 20000 K	Daylight: D75/D65/D50 Cool white fluorescent (CWF) TL-84/83; SPX35; Inc. “A”/Horizon; 10,000 K
350-700 nm	N/A
LED	3 fluorescent light sources: D65, D50, CWF/TL-84 incandescent “A”, and horizon
LEDcube: 30 x 30 x 21 cm Fixture: 62 x 50 x 187 cm (up to 3 cubes per fixture)	Two 133 x 76 x 86 cm illuminant banks mounted on 72 cm stands
Wired/wireless control via LED navigator software, touch screen control box, or USB cable	Optional wired/wireless remote control via PC tablet, rotary dial or digitally individual lamp control, multi-source option for creating mixed lighting conditions
Yes	No

Imatest Benchtop Test Stand

Benchtop fixture for macro image quality testing

Why Choose the Imatest Benchtop Test Stand?

The Benchtop Test Stand (BTS) is an easy-to-use, modular platform for image quality testing. Quickly test endoscopes and medical devices for sharpness, color accuracy and more using the endoscope module. Perform long range testing in a confined space using the target projector module. Derive objective metrics such as normalized stray light (flare) using images captured with the stray light module. Perform transmissive testing with Imatest lightboxes or light panels, or perform reflective testing using the optional magnetic chart mounting system.

Imatest Benchtop Test Stand Features

- ✓ Compact design: easily fits on a standard workbench or table (small footprint)
- ✓ Reflective or transmissive testing: up to 1 meter test distance
- ✓ Endoscope Module: ready to use for medical device fixturing
- ✓ Motorized BTS: automated positioning of cameras, light sources, and targets
- ✓ Stray Light (Flare) Module: normalized stray light characterization
- ✓ Target Projector Module: long range MTF testing in a confined space

Imatest Benchtop Test Stand Specifications

Specifications	Details
Weight:	BTS: 22.7 kg (50 lb) | BTS-R-KIT: 18.3 kg (40 lb) BTS-SLTP-MOTZ: 29.5 kg (65 lb) | BTS-SLTP: 20.4 kg (45 lb) BTS-E-KIT: 1.5 kg (3.3 lb) | BTS-MOTXZ: 34 kg (75 lb) BTS-500 mm: 16 kg (35 lb) | BTS-500-MOTXZ: 23 kg (50 lb) MOTY: adds 3.0 kg (6.6 lb)
Dimensions: Dimensions vary on configuration used	Width: 528 mm (20.79″) | w/ BTS-R-KIT: 665 mm (26.18″) Length: 1372 mm (54.02″) | BTS-500mm length: 772 mm (30.39″) Height w/ BTS-R-KIT: 692 mm (27.24″) | MOTY height: 463 mm (18.23″)
Transmissive Targets:	ILP-A | ILP-B | ILB-B Visible spectra: 3100 K | 4100 K | 5100 K | 6500 K NIR spectra: 850 nm | 940 nm
Reflective Targets:	Up to 665 x 500 mm in size (SFRreg 2X)
Translational Travel:	Motorized: Z-axis: 1045 mm | Y-axis: 150 mm | X-axis: 300 mm Manual: Z-axis: 1000 mm | Y-axis: 60 mm | X-axis: 500 mm BTS-500mm Z-axis: 450 mm | BTS-500 motorized Z-axis: 445 mm
SLTPM Translational Travel:	Motorized: Z-axis: 1045 mm | Y-axis: 60 mm | X-axis: 50 mm Manual: Z-axis: 1000 mm | Y-axis: 60 mm | X-axis: 50 mm
Rotational Travel:	Yaw: ± 2.5° | Pitch *or* Tilt: ± 2.5° | Endoscope: Yaw: 0°, 30°, 70°
Microstep Size (Default Resolution):	Z-axis: 4.21875 µm | X-axis: 0.49609375 µm
Motorized Accuracy (Unidirectional):	Z-axis: 700 µm | X-axis: 35 µm
Repeatability:	Z-axis: 20 µm | X-axis: 2.5 µm
Operating Temperature Range:	0 to 40 °C
Maximum DUT Weight:	11.34 kg (25 lb) | Endoscope Module: 3 kg (6.6 lb)
Electrical:	Z-axis: 1800 mA | X-axis: 1900 mA | Rotational axes: 950 mA Input Voltage: 100 – 240 VAC

Benchtop Test Stand Z Axis Calibration Kit

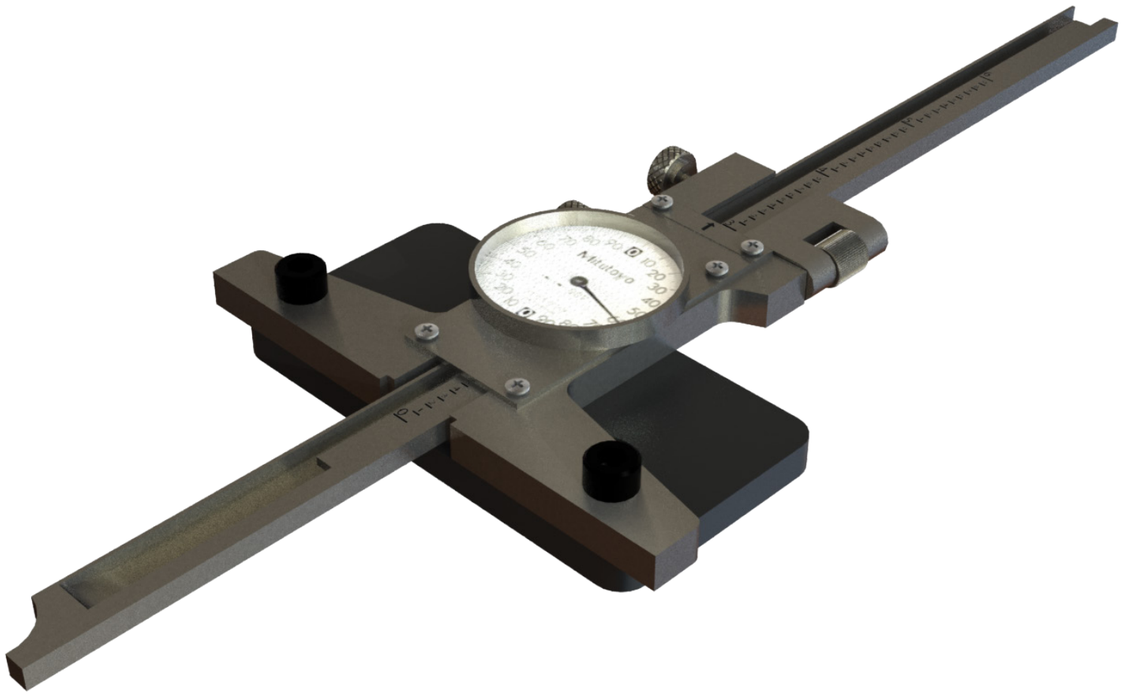
Calibration kit for the Benchtop Test Stand's optical axis

Why Choose the Benchtop Test Stand Z-Axis Calibration Kit?

Upgrade your Benchtop Test Stand (BTS) calibration process with the Z-axis calibration kit. This compact kit includes a precise depth gauge and a versatile BTS adapter plate, allowing for easy measurement of the distance between your camera and test chart. When used with Imatest's hardware control software, you can automate the positioning of your motorized BTS, enhancing efficiency and accuracy.

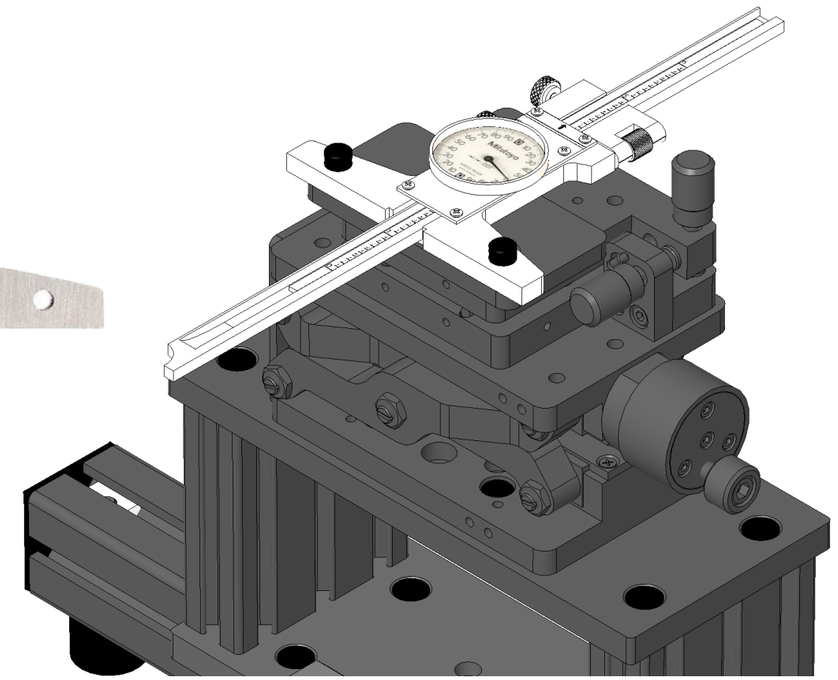
Benchtop Test Stand Z-Axis Calibration Kit Features

- ✓ Includes High Precision Mitutoyo depth gauge and adapter plate
- ✓ Easily integrates with Imatest Benchtop Test Stand
- ✓ Available in Analog or Digital



BTS Z-Axis Calibration Kit Specifications

Specifications	Details
Weight:	.23 kg (0.5 lb)
Dimensions:	260 mm x 100 mm x 25 mm (10.25" x 4" x 1")
Mounting Options:	Depth gauge: M5 x 70 mm | Adapter plate: M6 x 50 mm
Analog Depth Gauge Measuring Increments:	0.001"
Digital Depth Gauge Measuring Increments:	Metric mode: 0.01 mm | Imperial mode: 0.0005"
Digital Depth Gauge Accuracy:	Metric mode: ± 0.025 mm | Imperial mode: ± 0.001"



BTS Wide Field-of-View Module

3D target for testing resolution of wide field-of-view endoscopes

Why Choose the BTS Wide Field-of-View Module?

The BTS Wide Field-of-View (WFOV) Module integrates with the Imatest Magnetic Chart Holder or Imatest Light Boxes and Light Panels. The BTS WFOV Module provides an easy to use platform for testing sharpness of endoscopes and other short focal distance cameras with FOVs up to 180º. The 3D target includes angled aluminum blocks with high resolution fiber photographic matte SFRreg marks. The center and peripheral target holders are designed to converge at a specified test distance, and can accommodate a variety of different fields-of-view and focal lengths. Available at 16 mm and 32 mm convergence distances. Customization is available upon request to fit the needs of your wide field of view macro or micro camera system.

BTS Wide Field-of-View Module Features

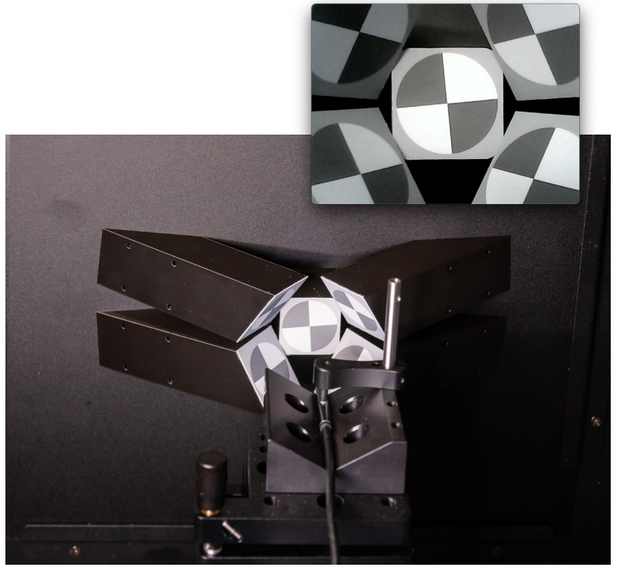
- ✓ Includes high resolution fiber photographic matte SFRreg marks
- ✓ Easy to use with Imatest Magnetic Chart Holder or Imatest Light Boxes and Light Panels
- ✓ Targets converge for specified test distances of 16 mm (±8 mm) or 32 mm (±8 mm)
- ✓ Customization available upon request

BTS-WFOV-32mm

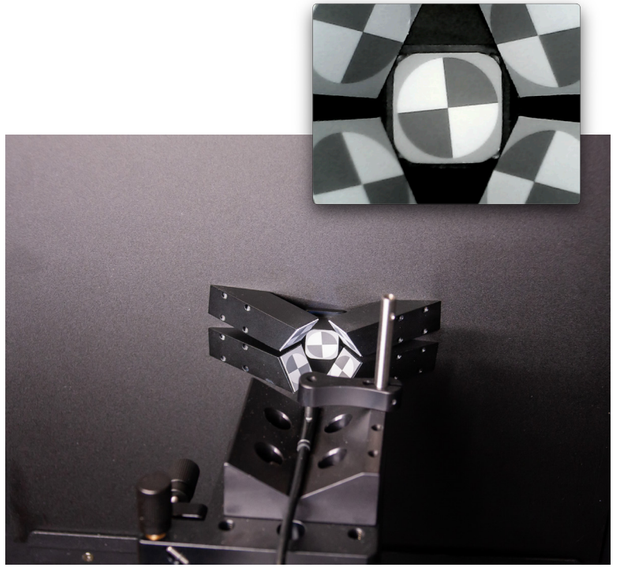
BTS-WFOV-16mm

BTS Wide Field of View Module

Specifications	Details
Frame Options (BTS-WFOV-16mm):	Size A, Size B, or Size C | Magnetic backing optional
Frame Options (BTS-WFOV-32mm):	Size B or Size C | Magnetic backing optional
Frame Dimensions:	Size A: 253 mm x 174 mm (9.96" x 6.85") Size B: 318 mm x 290 mm (12.52" x 11.42") Size C: 456 mm x 327 mm (17.95" x 12.87")
Total Thickness (with 3D Targets):	BTS-WFOV-16mm: 1.5" (38 mm) | BTS-WFOV-32mm: 2.76" (70 mm)
SFRreg Substrate:	Fiber photographic matte
Frame Material:	Matte black acrylic (6 mm thickness)
Angled Target Block Material:	Black anodized aluminum
Recommended Test Distances:	BTS-WFOV-16mm: 8 – 24 mm | BTS-WFOV-32mm: 24 – 48 mm
Recommended Field of View:	Up to 180º



BTS-WFOV-32mm



BTS-WFOV-16mm

Imatest Stray Light LED Source

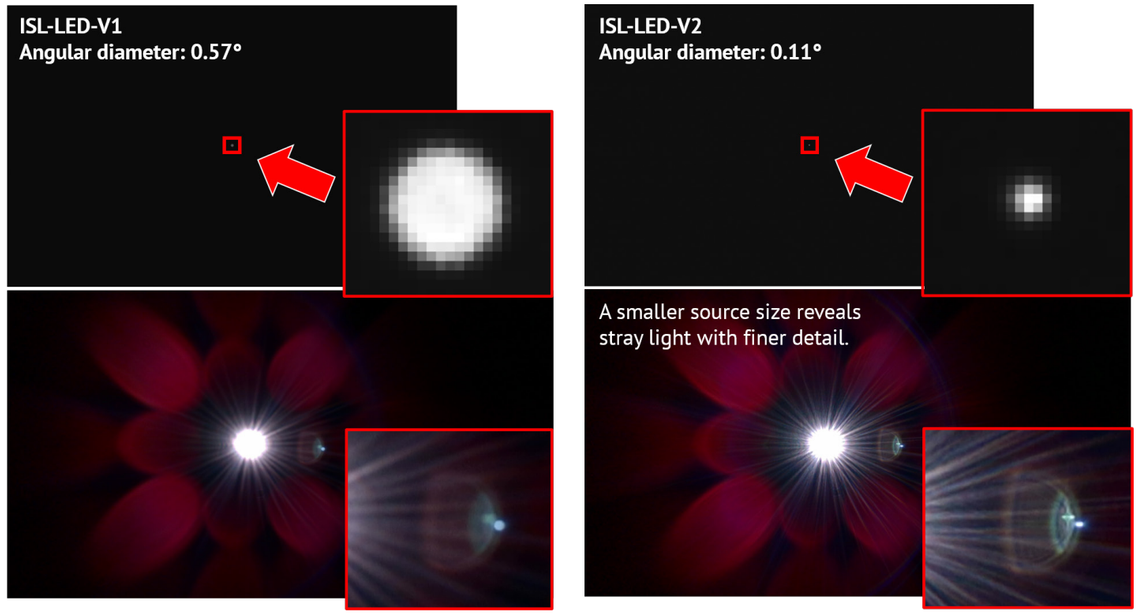
Visible or NIR collimated light source for characterizing stray light (flare)

Why Choose the Imatest Stray Light LED Source?

The Imatest Stray Light LED Source (V2) is specifically designed for characterization and testing of stray light (flare) in cameras. It projects an image of a small point-like source as a uniform, collimated beam of light. When imaged by a camera, the saturated image of the source produces stray light that can be visually inspected or analyzed using Imatest stray light analysis software. Available in visible (5700K White) and NIR (850nm, 940nm) spectra.

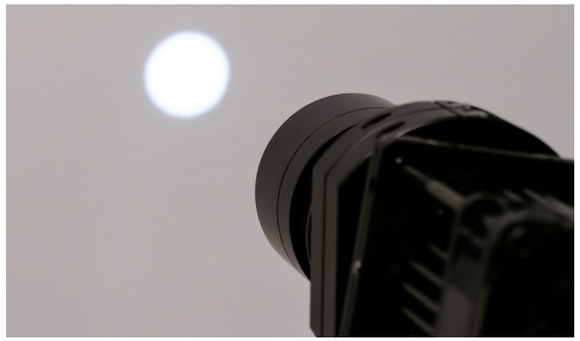
Imatest Stray Light LED Source Features

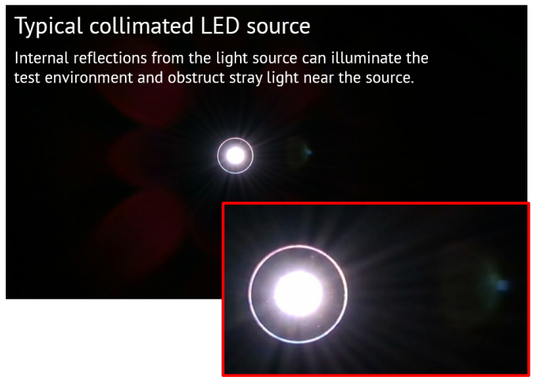
- ✓ Small source angular size for producing detailed, high resolution images of stray light
- ✓ Collimating lens is under-filled with light to achieve low internal reflections (no halo)
- ✓ Adjustable brightness to accommodate a wide variety of sensors
- ✓ Adjustable lens focus, allowing for both collimated or diverging beams
- ✓ Includes constant current LED driver for powering LED; TEC & fan powered by AC adapters

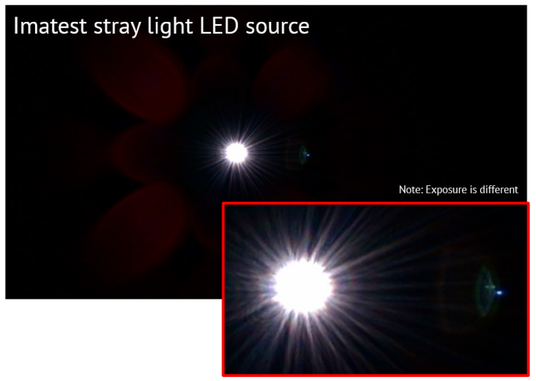


Imatest Stray Light Source Specifications

Specifications	Details
Light Source Dimensions:	204 mm x 94 mm x 75 mm (8.03" x 3.7" x 2.95")
Programmable LED Driver Dimensions:	93.2 mm x 52.5 mm x 27 mm (3.67" x 2.07" x 1.06")
Weight:	Light Source: 2.3 kg (5 lb) | LED Driver: 70 g (0.15 lb)
Projected Point Image Angular Diameter:	0.11°
Beam Diameter (at 1 meter Test Distance):	At min divergence: ~25 mm uniform beam diameter At max divergence: ~50 mm uniform beam diameter
Minumum Beam Divergence:	Adjustable collimation/focus down to ~0.055° (half divergence angle)
Safe Operating (S.O.) Voltage & Current:	AC adapter (fan): 11.85 V, 0.85 A | AC adapter (TEC): 5 V, 5 A
S.O. Voltage & Current (LEDs):	White: 3.16 V, 1.25 A | 940nm: 2.95 V, 1.0 A | 850nm: 3.25 V, 1.0 A
S.O. Beam Intensity (White LED, 5700K):	Illuminance: ~300 LUX | Irradiance (380-780 nm): ~1.3 W/m^2
S.O. Beam Intensity (NIR LED, 850nm):	Irradiance (750 – 950 nm: ~1.4 W/m^2
S.O. Beam Intensity (NIR LED, 940nm):	Irradiance: (800 – 1000 nm): ~1.4 W/m^2
Design Testing Distance:	Up to 1 meter
Programmable LED Driver:	Constant-current LED driver with USB 2.0 interface







Imatest Stray Light ND Filter Kit

Neutral Density Filter Kit for Imatest Stray Light Source

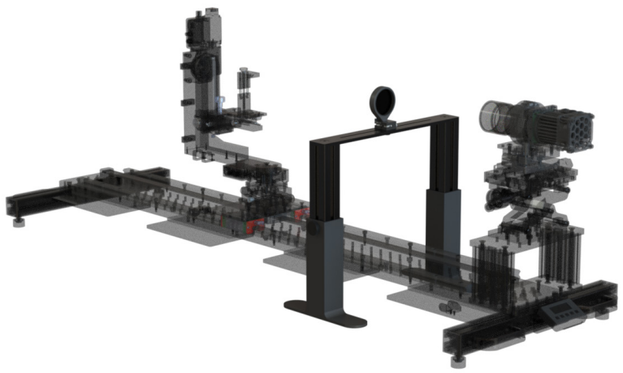
Why Choose the Imatest Stray Light ND Filter Kit?

The Neutral Density (ND) Filter Kit for the Imatest Stray Light LED Source enhances the process of characterizing and testing stray light (flare) in cameras. The ISL-LED emits a uniform, collimated beam of light that represents a small point-like source. For cameras without adjustable gain and exposure settings, the ND Filter is used to capture an unsaturated image of the source, essential for calculating stray light metrics like P2020 Normalized Stray Light and Point Source Rejection Ratio (PSRR).

The optional white glass diffuser is used for capturing images of the diffuse beam profile. Some metrics explicitly require this capture (an on-axis image of a uniform neutral Lambertian diffuser in front of the light source), as well as measurement of the diffuser's luminance/radiance.

Imatest Stray Light ND Filter Kit Features

- ✓ Allows you to easily add and remove the ND filter or white glass diffuser from the BTS
- ✓ Accommodates other optics mounted within the included 50mm ring mount or M4 slot
- ✓ ND Filter features excellent parallelism and surface characteristics to provide constant, ultra-broadband performance from 190 – 1700 nm
- ✓ Miniature tip-tilt stage to ensure proper filter to light source alignment



Stray Light ND Filter Kit Specifications

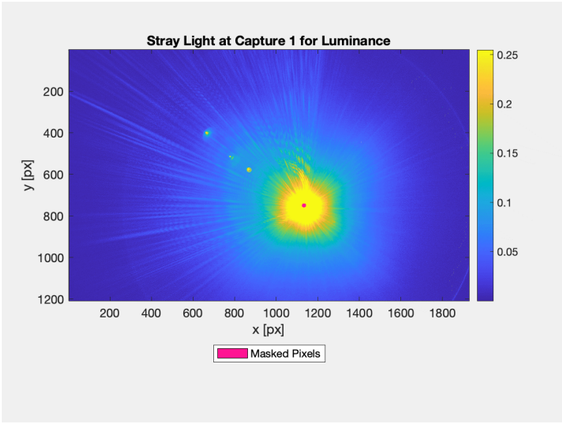
Specifications	Details
Weight:	2 kg (4.5 lb)
Dimensions:	197 mm x 375 mm x 315 – 460 mm (7.75" x 14.75" x 12.4 – 18.1")
Mounting Options:	Designed for versatile placement over BTS or IMTS
Filter Mounting Options:	50 mm ring mount and M4 clearance slot 100 mm long

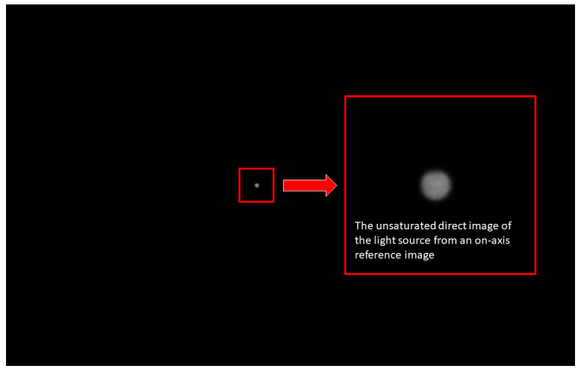
ND Filter Specifications

Specifications	Details
Neutral Density Filter:	2.5 OD UV-NIR reflective ND filter
Blocking Wavelength Range:	190 – 1700 nm
Dimensions:	Diameter: 50 mm | Thickness: 5.00 mm ± 0.10
Clear Aperture:	80%
Material:	Substrate: fused silica (corning 7980) | Coating: metallic based ND
Surface Quality:	40-20 Scratch-Dig
Transmission:	0.3%
Transmitted Wavefront, P-V:	λ/4
Parallelism:	<5 arcsec

White Glass Diffuser Specifications

Specifications	Details
Stacking:	Kit includes 2 layers of glass for sufficient diffusion
Wavelength Range:	400 – 700 nm
Dimensions:	Diameter: 75 mm | Thickness: 1.25 mm ±0.10
Surface Quality:	80-50 Scratch-Dig





Imatest Motorized Gimbal

Automated rotational positioning for imaging systems

Why Choose the Imatest Motorized Gimbal?

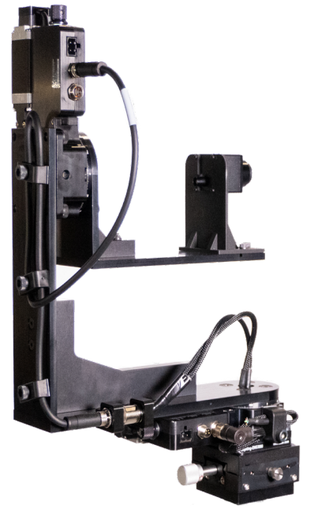
The motorized gimbal allows for automated rotational positioning of your camera. The Motorized Gimbal includes 2 axes of automated rotational positioning and one axis of manual rotational positioning. Create automated test plans with many camera poses.

Imatest Motorized Gimbal Features

- ✓ Easily connect using USB 2.0 or serial communication ports or send commands over RS-232.
- ✓ Zaber's Console software makes it easy to control the speed and position of the target, change the device settings, and write custom scripts.
- ✓ Manual indexed knobs provide motorized motion control even without a computer.
- ✓ Rotational Travel (Stray Light Configuration): Rx = ± 10°, Ry = 360°, Rz = 360°
- ✓ Rotational Travel (Target Projector Configuration): Rx = 360°, Ry = 360°, Rz = ± 10°
- ✓ Maximum Speed: 450°/s
- ✓ Control Interface: USB Serial Interface, Zaber control software, Python, C++ Motion Libraries

Imatest Motorized Gimbal Specifications

Specifications	Details
Weight:	4.7 kg (10.36 lb)
Dimensions:	266.3 mm x 91.3 mm x 370.7 mm (10.48" x 3.59" x 14.59")
Rotational Travel (Stray Light Configuration):	Rx: ± 10° | Ry: 360° | Rz: 360°
Rotational Travel (Target Projector Config):	Rx: 360° | Ry: 360° | Rz: ± 10°
Maximum Field of View:	VFOV: 158° | HFOV: >180°
Microstep Size (Default Resolution):	0.0009375°
Accuracy (Unidirectional):	0.08°
Repeatability:	0.02°
Backlash:	0.04°
Maximum Speed:	450°/s
Peak Thrust:	105 N•cm
Operating Temperature Range:	0 to 50°C
Maximum DUT Weight:	2.5 kg (5.5 lb)
Electrical:	Voltage: 100 – 240 VAC input | Maximum Current Draw: 1.9 A



Imatest Adjustable Motorized Gimbal

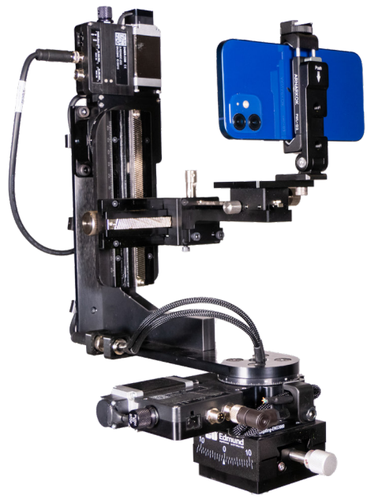
Automated rotational positioning for imaging systems

Why Choose the Imatest Adjustable Motorized Gimbal?

The motorized gimbal allows for automated rotational positioning of your camera. The Motorized Gimbal includes two axes of automated rotational positioning and one axis of manual rotational positioning. Create automated test plans with many camera “poses”. The adjustable motorized gimbal includes three axes of translational positioning, which allows you to quickly mount phones, dev boards, web cams, and more without the need for a dedicated device holder.

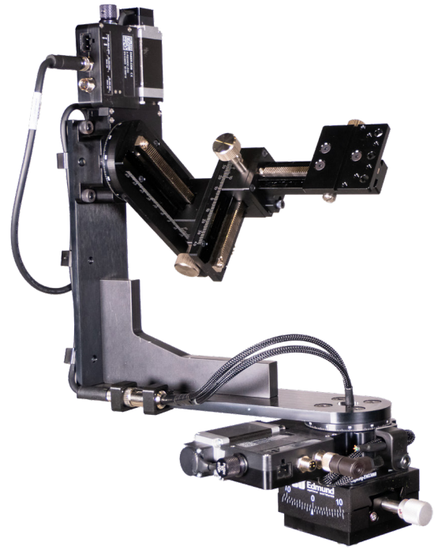
Imatest Motorized Gimbal Features

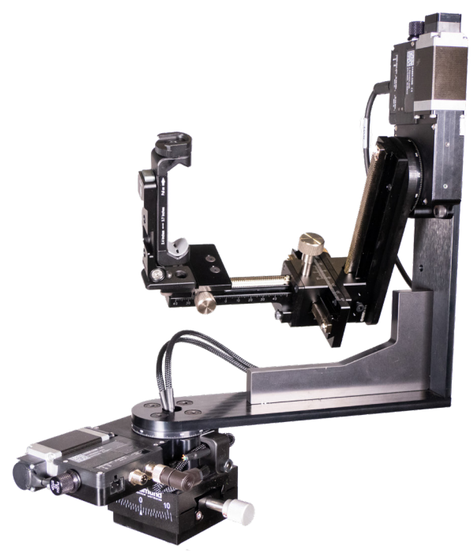
- ✓ Easily connect using USB 2.0 or serial communication ports or send commands over RS-232.
- ✓ Zaber’s Console software makes it easy to control the speed and position of the target, change the device settings, and write custom scripts.
- ✓ Manual indexed knobs provide motorized motion control even without a computer.
- ✓ Three axes of translational positioning eliminate the need for a dedicated device holder.
- ✓ Control Interface: USB Serial Interface, Zaber control software, Python, C++ Motion Libraries
- ✓ Includes alignment jig for placing the front-most lens element at the center point of rotation



Imatest Adjustable Motorized Gimbal Specifications

Specifications	Details
Weight:	5 kg (11lb)
Dimensions:	266.3 mm x 91.3 mm x 370.7 mm (10.48” x 3.59” x 14.59”)
Rotational Travel (Stray Light Configuration):	Rx: ±10° | Ry: 360° | Rz: 360°
Translational Travel:	Tx: ± 30 mm | Ty: ± 55 mm | Tz: 80mm
Maximum Field-of-View:	VFOV: 158° | HFOV: >180°
Microstep Size (Default Resolution):	0.0009375°
Accuracy (unidirectional):	0.08°
Repeatability:	0.02°
Backlash:	0.04°
Maximum Speed:	450°/s
Peak Thrust:	105 N•cm
Operating Temperature Range:	0 to 50° C
Maximum DUT Weight:	2.5 kg (5.5 lb)
Electrical:	Voltage: 100-240 VAC input | Maximum Current Draw: 1.9 A





Imatest Blackout Curtain Fixtures

Controlled lighting environments for precise & repeatable image quality testing

Why Choose the Imatest Blackout Curtain Fixture?

Accurate and repeatable image quality analysis requires a controlled environment, free from ambient light which can introduce variables and compromise results. Isolating your test setup from external light sources improves the integrity of critical image quality measurements. Imatest Blackout Curtain fixtures are designed and sized to be used with our Modular Test Stand, Reflective Lighting Modules, Benchtop Test Stand, and Collimator Fixture. They are an essential piece of equipment for stray light (flare) testing.

Imatest Blackout Curtain Fixture Features

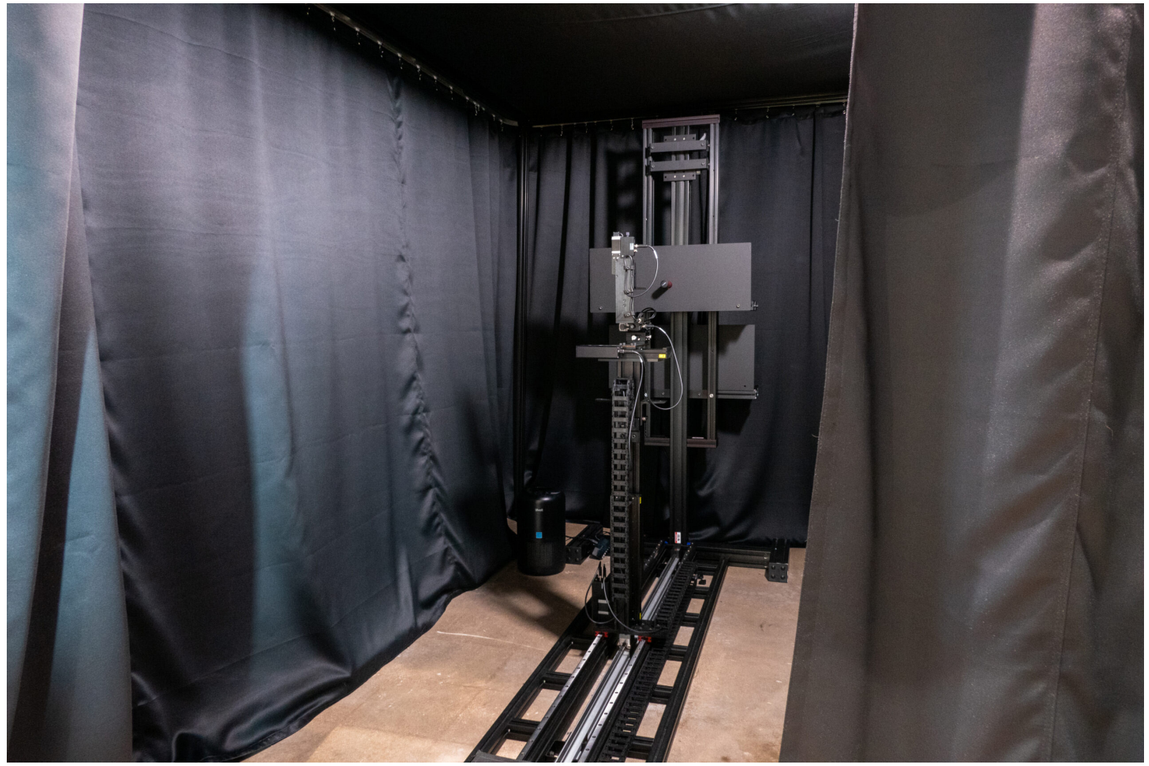
- ✓ Constructed with sturdy 40 series black anodized aluminum extrusions
- ✓ Includes industry leading curtains from Covoc
- ✓ Freestanding design can be installed in any lab
- ✓ Custom sizes available upon request

BTS-CRT

Imatest Blackout Curtain Fixture Specifications

SKU	Dimensions	Weight
BTS-CRT	1.375 m x 0.943 m x 1.378 m (54.13″ x 37.13″ x 54.25″)	24 kg (53 lb)
IMTS-2M-CRT	2.19 m x 3.19 m x 2.21 m (86″ x 125″ x 87″)	54.4 kg (120 lb)
IMTS-RM2M-CRT	3.38 m x 3.19 m x 2.21 m (133″ x 125″ x 87″)	61.2 kg (135 lb)

Specifications	Details
Curtain Style	Aluminum track; capped with valence
Fabric	Black Textron
Closure	Hook and loop
Frame	Freestanding extruded aluminum fixture with steel brackets



IMTS-2M-CRT with IMTS-2m-MOTXYZ

Imatest Modular Test Stand

Easy-to-use platform for consistent imaging tests

The Modular Test Stand (MTS) facilitates precise setup and repeatable camera positioning for consistent imaging tests. The MTS enables you to produce superior cameras while significantly reducing time spent in the lab. The MTS is configurable to accommodate your camera system. Optional add-on modules include reflective lighting and wide field-of-view options.

Included with the Fixture

- ✓ Custom rail system for easy positioning
- ✓ Ruler and laser rangefinder for precise test distance measurements
- ✓ Reliable camera mount (tripod head or gimbal head)
- ✓ Adjustable chart holder that conforms to a variety of test targets
- ✓ Accommodates Imatest Light Boxes and Light Panels
- ✓ Controlled alignment that enables tilt and rotation measurements
- ✓ Standard camera rail lengths of 2m or 3.5m (custom lengths available upon request)

IMTS-2m

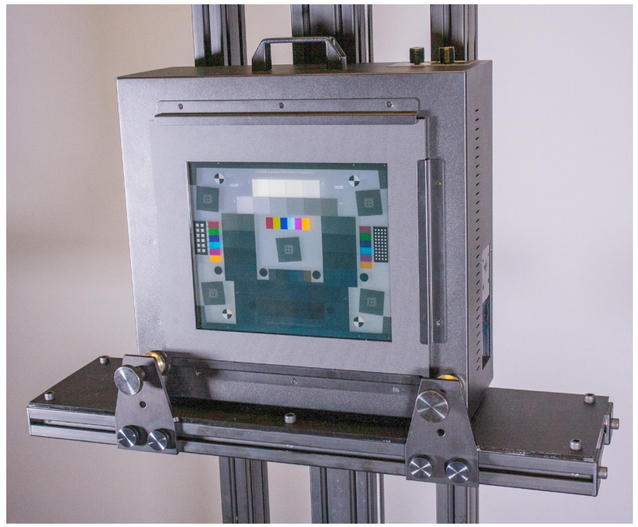
IMTS-2m with eSFR ISO Chart

Imatest Modular Test Stand Specifications

SKU*	Dimensions	Weight	Shipping Dimensions	Shipping Weight
IMTS-2m	1.00 m x 2.40 m x 2.02 m	175 lb (101 kg)	2.34 m x 0.52 m x 0.66 m	350 lb (159 kg)
IMTS-3.5m	1.00 m x 3.98 m x 2.02 m	280 lb (127 kg)	2.08 m x 0.51 m x 0.69 m	419 lb (190 kg)

Specifications	Details
Camera Tilt (R_Z)	Geared Tripod Head: - 90° / + 30° | Gimbal Head: 0°
Camera Pitch (R_X)	Geared Tripod Head: - 10° / + 90° | Gimbal Head: 360°
Camera Rotation (R_Y)	Tripod Head: 360° | Gimbal Head: 300°
X-Axis Translation	120mm
Reflective Chart Size Range	Min: 21.58 x 27.94 cm (8.50" x 11") | Max: 110 x 144 cm (3.94" x 56.69")
Transmissive Chart Size Range	Imatest Light Panel: Size C, D, E, F, and G | Imatest Light Box: Size B or C
Testing Distance Measurement	Includes laser rangefinder & camera rail ruler with physical indicators
Material	6105-T5 aluminum (black anodized)

*Custom configurations available upon request



IMTS-2m with ILB-B and UHDR Chart

IMTS-2m with ILP-D

Imatest Motorized Test Stand

Easy-to-use motorized platform for consistent imaging tests

Why Choose the Imatest Motorized Test Stand?

The motorization of each IMTS axis allows for automated positioning of the Camera. Create automated test plans with many camera-to-chart test distances. Perform live depth of field tests using a computer controlled stage with precise linear movements.

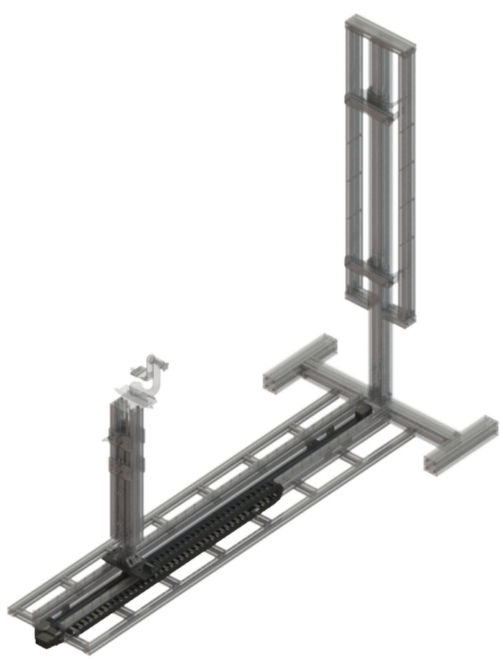
Imatest Motorized Test Stand Features

- ✓ Easily upgrade your existing Modular Test Stand
- ✓ Includes linear stages, dragchains, and adapter kits
- ✓ Includes lifting column and Imatest control box for motorized vertical axis
- ✓ Easily connect using USB 2.0 or serial communication ports
- ✓ Imatest Control API allows for seamless control of all axes
- ✓ The X-axis and Z-axis include an indexed knob which provides manual control
- ✓ Control Interfaces: USB Serial, Zaber Console Software, Python 3, Imatest Control API

Imatest Motorized Test Stand Specifications

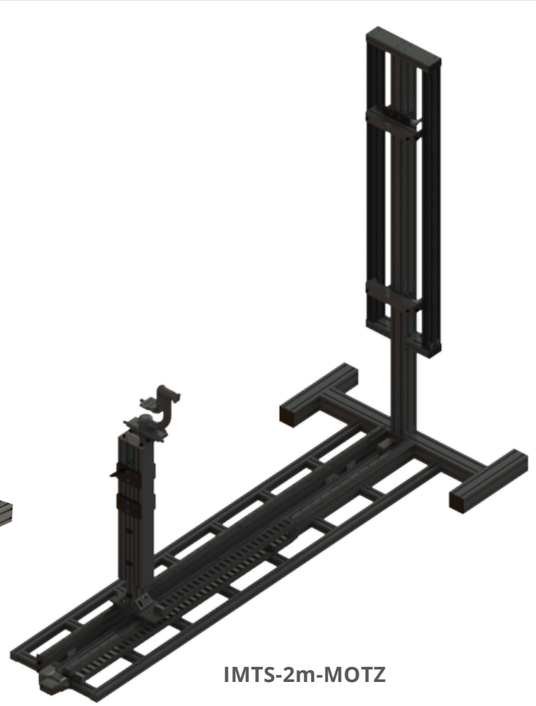
Specifications	Details
Motorized IMTS-2m Weight	MOTZ: 85.73 kg (189 lb) | MOTY: 81.65 kg (180 lb) MOTYZ: 88.45 kg (195 lb) | MOTXYZ: 93 kg (205 lb)
Motorized IMTS-3.5m Weight	MOTZ: 136.1 kg (300 lb) | MOTY: 129.27 kg (285 lb) MOTYZ: 138.35 kg (305 lb) | MOTXYZ: 140.61 (310 lb)
Motorized IMTS Dimensions	IMTS-2m: 2.395 m x 1.00 m x 2.02 m | IMTS-3.5m: 3.977 m x 1.0 m x 2.020 m
X-Axis Travel (Horizontal)	150 mm (longer travel available by request)
Y-Axis Travel (Vertical)	500 mm
Z-Axis Travel (Optical Distance)	IMTS-2m: 1900 mm | IMTS-3.5m: 3450 mm
Maximum Speed	X-axis: 54 mm/s | Y-axis: 18 mm/s | Z-axis: 1857 mm/s
Accuracy	X-axis: 45 µm | Y-axis: 1.95 mm | Z-axis: 1.6 mm
Repeatability	X-axis: < 2.5 µm | Y-axis: 1.77 mm | Z-axis: < 20 µm
Peak Thrust	X-axis: 230 N | Y-axis: 1500 N | Z-axis: 90 N
Maximum DUT Weight	Camera Post: 100 lb | Lifting Column: 150 lb | Tripod / Gimbal Head: 10 lb
Electrical	100V-240 VAC | Maximum Current Draw (MOTXYZ): 8900 mA

IMTS-2m-MOTXYZ-KIT



IMTS-2m-MOTZ-KIT

IMTS-2m-MOTXYZ



IMTS-2m-MOTZ

Imatest MTS Reflective Module

Add-on to the Imatest Modular Test Stand

Why Choose the MTS Reflective Module?

The Imatest Reflective Module is an add-on to the Imatest Modular Test Stand. The easy-to-use Module is designed to work with Kino Flo Freestyle 31 lights, Metaphase NIR ExoLights, and reflective charts. High-quality hardware allows you to effortlessly position lights, while angle and position markers indicate light bank locations for repeatable lighting configurations. The base module, target, and lights are sold separately. Custom configurations available upon request.

MTS Reflective Module Features

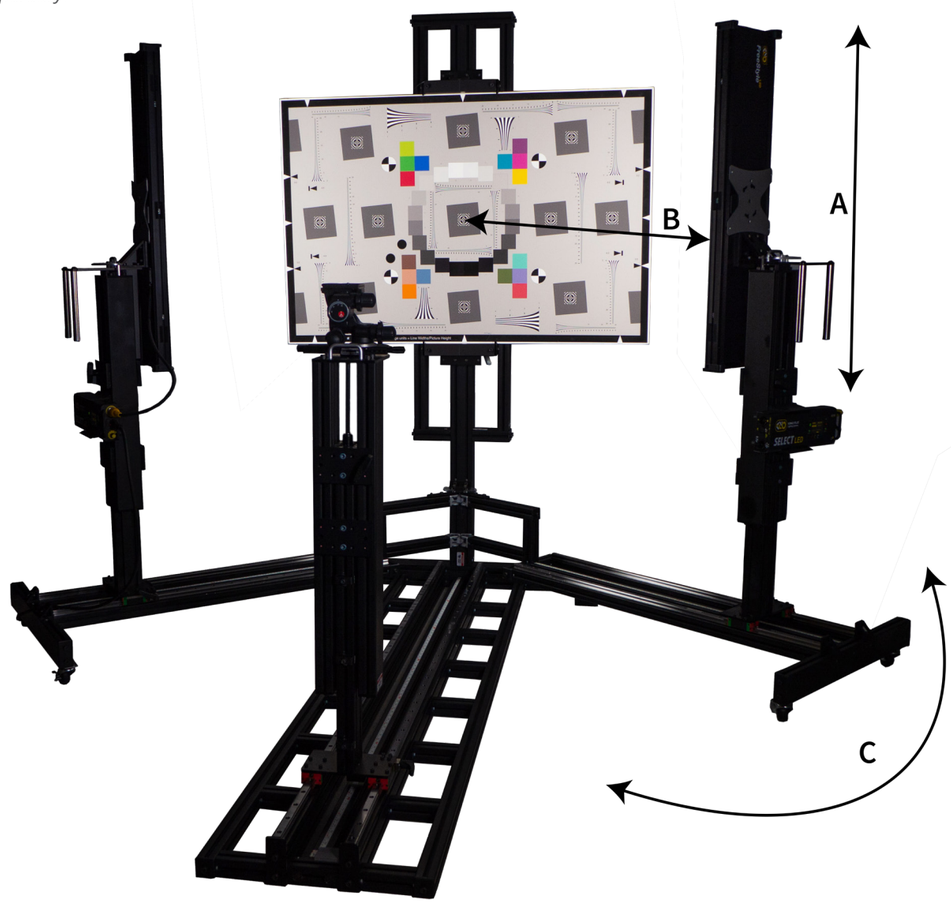
- ✓ Physical indicators to mark positions
- ✓ Angle indicators to determine incident light angles
- ✓ Easy and dampened height adjustment
- ✓ Designed to work with Kino Flo Freestyle 31 lighting system or Metaphase NIR ExoLight (850nm or 940nm) or both with Dual setup

IMTS-2m with IMTS-RM-VIS

MTS Reflective Module Specifications

Specifications	Details
Weight	54 kg (120 lb)
Shipping Crate Dimensions	1.4 m x 0.66 m x 0.65 m (54” x 16” x 26”)
Total Shipping Weight with Crate	91 kg (200 lb)
Width hen Fully Extended	3100 mm (122”)
Travel Range of Lights*	A. Height adjustment: 400 mm (11.81”) B. Distance from chart: 250 mm (39.37”) – 1250 mm (49.21”) C. Incident angle: 22° – 90°

**lights sold separately.*



IMTS-2m with IMTS-RM-VIS and eSFR ISO chart

Imatest Light Stands

Freestanding fixtures for visible and NIR reflective lighting

Why Choose the Imatest Light Stands?

Imatest Light Stands enable quick, repeatable lighting setups. They are compatible with Kino Flo LED Freestyle 31 and Metaphase Exolight 2.0 (850nm or 940nm IR) lights. High-quality hardware includes features like angle markers, lockable casters and a smooth height adjustment system. Custom configurations are available upon request.

Imatest Light Stand Features

- ✓ Lockable casters allow for freely positioning the light stands
- ✓ Additional angle adjustment of each light bank with built-in protractors
- ✓ Easy and dampened height adjustment.
- ✓ Works with Kino Flo Freestlye 31 lighting system (Visible).
- ✓ Works with Metaphase 850 nm or 940 nm IR Exolights 2.0 (NIR).

LS-DUAL with KF-F31-LIGHTS and MP-NIR-940

Imatest Light Stand Specifications

Specifications	Details
Weight (Pair):	LS-VIS: 29.5 kg (65 lb) | LS-NIR: 27.25 kg (60 lb) | LS-DUAL: 31.75 kg (70 lb)
Fixture Dimensions (min height):	620 x 509 x 1562 mm (24.41" x 20" x 61.5")
Fixture Dimensions (max height):	620 x 509 x 1971 mm (24.41" x 20" x 77.6")
Crate Dimensions	1.07 m x 0.74 m x 0.89 m (42" x 29" x 35")
Total Shipping Weight:	LS-VIS: 61.25 kg (135 lb) | LS-NIR: 59 kg (130 lb) | LS-DUAL: 63.5 kg (140 lb)
Travel Range of Lights:	A. Height adjustment: 400 mm (15.75") B. Distance from chart: free positioning C. Incident angle: 0° – 90°

**lights sold separately.*

LS-DUAL with KF-F31-LIGHTS and MP-NIR-940

Imatest Wide Field-of-View Module

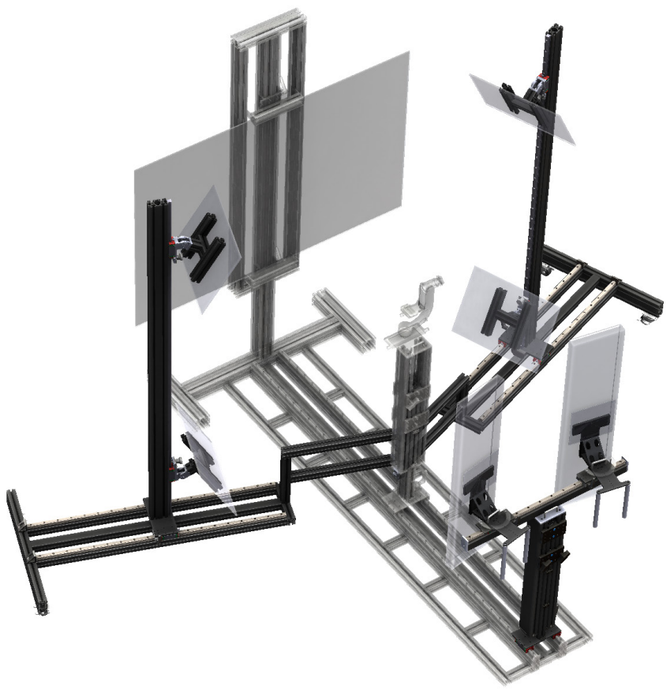
Add-on to the Imatest Modular Test Stand

Why Choose the WFOV Module?

The Imatest Wide Field-of-View (WFOV) Module integrates with Imatest's Modular Test Stand base module and provides an easy to use platform for testing sharpness of cameras with FOVs up to 200º. The fixture includes three rail systems for easy mounting and positioning of camera devices, peripheral test targets, and Kino Flo LED lights (sold separately). The main chart holder and peripheral target holders can accommodate a variety of different sizes.

WFOV Module Features

- ✓ Polar-coordinate system for four adjustable reflective SFRReg targets or light panels
- ✓ Sliding light post for mounting visible, NIR, or dual spectrum lights for uniform illumination
- ✓ Mounting points for Imatest Spectral Illuminance Color Sensors and Low Light Illuminance Sensors for measuring lighting and color uniformity across the ancillary targets



IMTS-RWFOV

Imatest Wide Field-of-View Module Specifications

Specifications	Details
Fixture Weight	78.5 kg (173 lb)
Shipping Crate Dimensions	2.03 m x 0.61 m x 0.53 m (80" x 24" x 21")
Total Shipping Weight with Crate	149 kg (328 lb)
Testing Distance Range	0.5 m – 1.5 m (19.69" – 59.06") @ 3:2 or 16:9 camera aspect ratio
Testing Field-of-View	Recommended camera diagonal FOV: 140° – 200°
Recommended Test Charts	Test Distances < 1 m (39.37"), FOV < 160º: WFOV-CHT-SM (4 x SFRreg - Size 0.5x + eSFR ISO - Size 2x) Test Distances < 1 m (39.37"), FOV >160º: WFOV-CHT-MD (4 x SFRreg - Size 1x + eSFR ISO - Size 2x) Test Distances > 1 m (39.37"): WFOV-CHT-LG (4 x SFRreg - Size 1.5x + eSFR ISO - Size 4x)

IMTS-2m with IMTS-RWFOV, WFOV-CHT-LG, and KF-31-LIGHTS

Freestanding Wide Field-of-View Fixture

Freestanding fixture for wide field-of-view testing

Why Choose the Freestanding WFOV Fixture?

The Imatest Freestanding Wide Field of View (WFOV) Fixture (set of two) provides an easy to use platform for testing sharpness of cameras with FOV up to 360°. The fixture includes a rail system for easy mounting and positioning peripheral test targets or Imatest Light Panels (sold separately). The peripheral target holders can accommodate a variety of different sizes.

Freestanding WFOV Fixture Features

- ✓ Mounting system for four reflective SFRreg targets: easily adjust distance, angle, & height
- ✓ Lockable casters for securing fixture positions
- ✓ Discrete target heights for repeatable measurements
- ✓ Pivot arms allow for angular positioning of the peripheral targets
- ✓ Embedded magnets for Imatest light sensors: measure illumination & color spectrum
- ✓ Compatible with ILP-A and ILP-B (Imatest Light Panels Size A or B)
- ✓ Compatible with IMTS-R-KIT for magnetic chart mounting or chart storage

WFOV-FS

WFOV-FS-SINGLE with IMTS-R-KIT

Freestanding Wide Field-of-View Specifications

Specifications	Details
Fixture Weight (Pair):	37 kg (81.5 lb)
Fixture Dimensions:	620 mm x 509 mm x 1960.5 mm (24.41" x 20" x 77.19")
Recommended Testing Distance:	0.5 m – 1.5 m (19.69" – 59.06") @ 3:2 or 16:9 camera aspect ratio
Testing Field-of-View:	Up to 360°
Recommended Test Charts:	Test Distances < 1 m (39.37"), FOV < 160°: WFOV-CHT-SM (4 x SFRreg - Size 0.5x + eSFR ISO - Size 2x) Test Distances < 1 m (39.37"), FOV >160°: WFOV-CHT-MD (4 x SFRreg - Size 1x + eSFR ISO - Size 2x) Test Distances > 1 m (39.37"): WFOV-CHT-LG (4 x SFRreg - Size 1.5x + eSFR ISO - Size 4x)

WFOV-FS with Reg-R-1.5x-4-NIR-RWFOV (Mounted)

WFOV-FS with CB21508 (ePanel + magnetic backing)

Imatest Linear Motion Blur Module

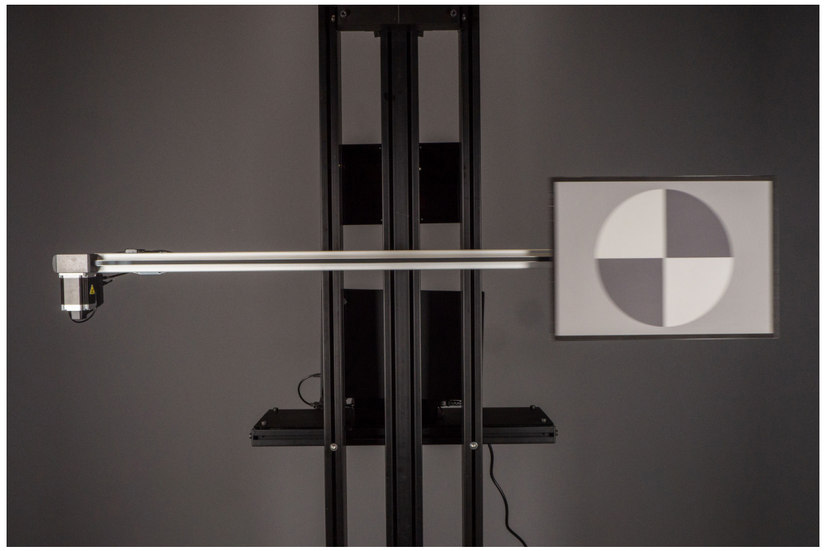
Add-on to the Imatest Modular Test Stand

Why Choose the Imatest Linear Motion Blur Module?

Test the effects of moving objects using a computer-controlled stage with precise linear movements. This add-on module to the Imatest Modular Test Stand allows you to test motion blur and simulate scene motion.

MTS Reflective Module Features

- ✓ Includes a recirculating ball bearing carriage which provides high load and lifetime
- ✓ Easily connect using USB 2.0 or serial communication ports
- ✓ Send commands over RS-232
- ✓ Zaber's Console software makes it easy to control the speed and position of the target, change the device settings, and write custom scripts.
- ✓ The linear stage system includes an indexed knob which provides manual control
- ✓ Travel: 1150 mm
- ✓ Maximum Speed: 1857 mm/s
- ✓ Control Interface: USB Serial, Zaber Console Software, Python 3 - Zaber Motion Library

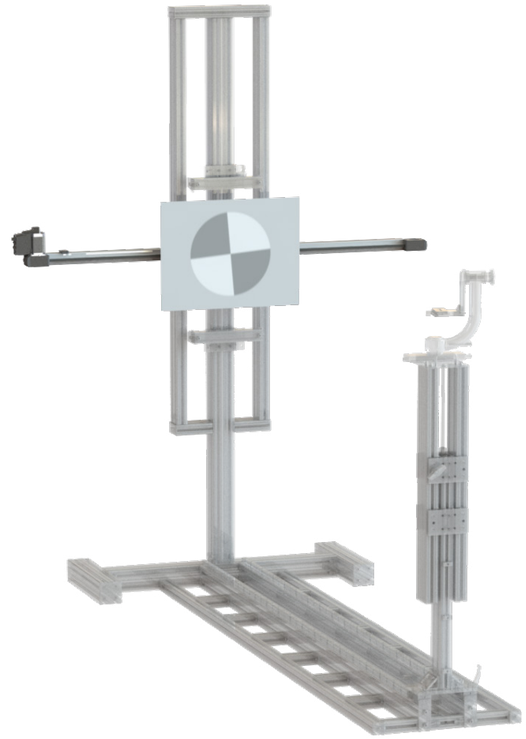


IMTS-2m with IMTS-MB

Imatest Linear Motion Blur Specifications

Specifications	Details
Weight	7.71 kg (17 lb)
Slider Dimensions	1489.7 mm x 134 mm x 76 mm (58.65" x 5.28" x 2.99")
Linear Motion	Travel: 1150 mm | Maximum Speed: 1857 mm/s*
Microstep Size (Default Resolution)	7.03125 µm
Precision	Accuracy (unidirectional): 1,037.5 µm | Repeatability: < 20 µm
Backlash	< 250 µm
Motor Power	Peak Thrust: 90 N | Maximum Torque: 180 N•cm
Operating Temperature Range	0° to 50° C
Maximum Load	Maximum Centered Load: 500 N | Maximum Cantilever Load: 5 N•m
Electrical	Input Voltage: 110 V / 220 V

***Longer travel options for increased maximum speed (up to 3 m/s) available upon request**



IMTS-2m with IMTS-MB

Imatest Collimator Fixture

Relay lens system for simulating long test distances

Why the Imatest Collimator Fixture?

Understanding the performance of an imaging system at its operational working distance is crucial, but testing at long distances isn't always practical, especially in a production environment. Testing your imaging system at distances up to infinity can be achieved using relay optics. The Imatest Collimator Fixture is compatible with various relay lenses and light panel sizes to accommodate your camera's field-of view.

Collimator Fixture Features

- ✓ Motorized camera gantry for precise alignment with the relay optical axis of the collimator
- ✓ Motorized Light Panel Stage for calibrated control of simulated distances
- ✓ Joystick & computer-control interface for automatic positioning of camera and target
- ✓ Intuitive GUI with storage and recall of device positions
- ✓ Calibration routines for precise alignment of camera entrance pupil & relay lens exit pupil

ICF with ILP-D, ISO-ESFR-453-Col-D, OSCL736i and OSCL-AP-736i

Imatest Collimator Fixture Specifications

Specifications	Details
Weight	40.8 kg (90 lb)
Dimensions	1300 mm x 951 mm x 797 mm (37.44" x 51.18" x 31.38")
Supported Light Panels	ILP-C | ILP-D | ILPG
Electrical	Input voltage: 110 V / 220 V Onboard computer maximum current draw: 0.35 A Motorized stages maximum current draw: 5.0 A Light panel maximum current draw: 1.7 A

Relay Lens Specifications

Lens	Wavelength	FOV	Exit Pupil Size	Virtual Object Distance
CL736i	Visible	70°	15.0 mm	400 mm – Infinity
CL921e	Visible	90°	4.5 mm	400 mm – Infinity
CL1021i	Visible	100°	4.5 mm	400 mm – Infinity
CL1223i	Visible	120°	4.5 mm	350 mm – Infinity
CL825IR	NIR (850 nm, 940 nm)	80°	4.0 mm	400 mm – Infinity
CL921IR	NIR (850 nm, 940 nm)	90°	4.5 mm	400 mm – Infinity

70° medium field-of-view collimator lens

90° field-of-view collimator lens for mobile

120° wide field-of-view collimator lens

10° Target Projection Collimator

Simulated long-distance testing for confined spaces

Why Choose the 10º Target Projector?

The OSCM10120 Collimator projects a target at a simulated distance, which allows for long distance testing in a confined space. The simulated distance can be manually adjusted with the diopter barrel, with optional motorization for automated adjustments. This collimator comes with a high resolution, black and white LVT film SFRreg target reticle and projects a 10º inspectable field-of-view. A complete OSCM10120 system requires an LED controller.

10º Target Projector & LED Controller Features

- ✓ Manual or motorized adjustable diopter barrel for changing simulated distance
- ✓ Simulate test distances from 1m to infinity
- ✓ Test camera systems with long focus distances in labs or production lines
- ✓ Includes high-resolution B&W film target reticle
- ✓ Independent channel control for multiple units (up to 13 channels)
- ✓ Visible & NIR LED options available: 6000 K, 850 nm, or 940 nm
- ✓ 3000 K, 4000 K, & 5000 K LEDs available upon request

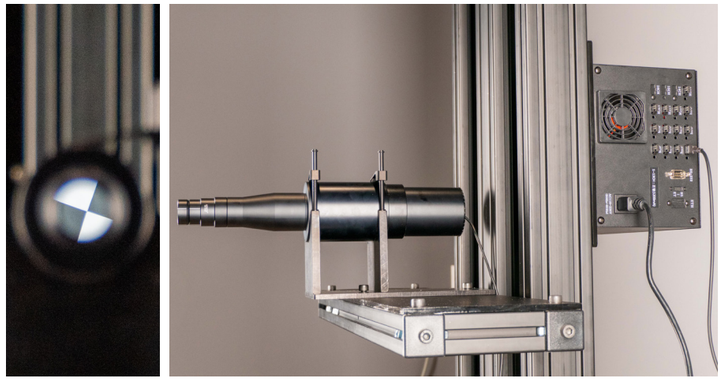
OSCM10120M-REG-SET (Motorized)

10º Target Projector Specifications

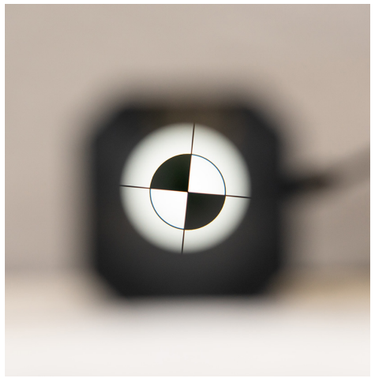
Specifications	Manual	Motorized
Weight	Net weight: 1.08 kg (2.38 lb)	Net weight: 3.25 kg (7.17 lb)
Shipping Weight	2.08 kg (4.59 lb)	4.25 kg (9.37 lb)
Overall Dimensions	376.5 mm x 77.4 mm (L x D)	451.5mm x 107mm x 111.5mm (L x W x H)
Inspectable FOV	10º	10º
Effective Focal Length	323.9 mm	323.9 mm
Exit Pupil Size	ø4.5 mm	ø4.5 mm
VIS LED Color Temperature	6000 K ± 500 K	6000 K ± 500 K
NIR LED Wavelengths	850 nm or 940 nm	850 nm or 94 0nm
Target Reticle Diameter	60.2 mm	60.2 mm

LED Controller Specifications

Specifications	OSLED-5CH	OSLED-8CH	OSLED-13CH
Weight	4.55 kg (10.03 lb)	5.95 kg (13.12 lb)	6.42 kg (14.15 lb)
Shipping Weight	5.55 kg (12.24 lb)	7.1 kg (15.65 lb)	7.42 kg (16.36 lb)
Overall Dimensions	Manual: 200 mm X 170 mm X 340 mm | Motorized: 264 mm X 182 mm X 353 mm		
Input Voltage	110 – 220 VAC		



OSCM10120-REG-SET (Manual) + IMTS-TPM



OSCM10120M-REG (Motorized)

Imatest Thouslite LEDCube & Fixture

Tunable LED light sources with adjustable stands

Why Choose the Imatest Thouslite LEDCube & Fixture?

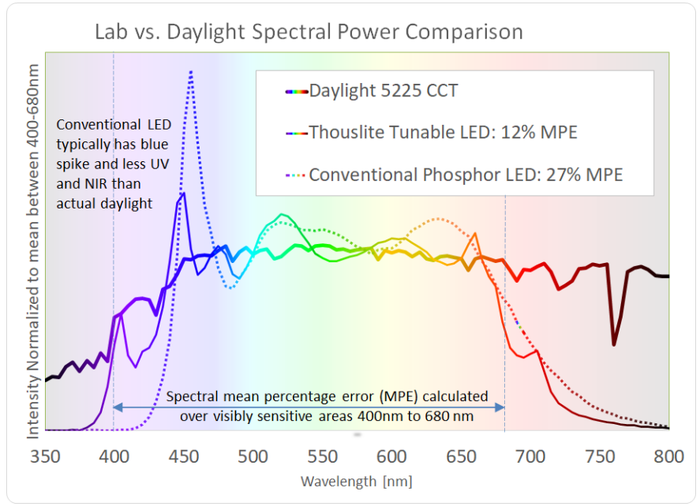
The Thouslite LEDCube and Imatest Fixture allow you to integrate this highly tunable reflective light source into your test lab. Reproduce any phase of daylight with the highest quality Color Rendering Index (CRI: 99) and Metamerism Index (MI: Grade A). Simulate various lighting environments to evaluate the performance of your cameras or sensors, including tests for auto white balance, color rendering, auto exposure, etc.

Imatest Thouslite LEDCube & Fixture Features

- ✓ Reproduce high quality blackbody & daylight illuminants, including tungsten and daylight
- ✓ Correlated Color Temperature (CCT) from 2700K to 6500K with CCT accuracy < ± 50K
- ✓ Luminance adjustable with no warm up time
- ✓ High uniformity (< 96%) with flicker free light output
- ✓ Optimized heat management and driver board design for excellent long term stability
- ✓ LEDCube hardware can save up to 80 light source presets, programmable via software
- ✓ Fast & accurate calibration: compatible with spectrometer and LEDNavigator software
- ✓ Dynamic lighting: programmable light sequences and intervals
- ✓ LED channel wavelength selection service includes UV, Visible, and NIR wavelengths
- ✓ Place up to 3 LEDCubes on each fixture using shelves with adjustable heights
- ✓ Position the fixtures in any position with lockable casters

Imatest Thouslite LEDCube & Fixture Specifications

Specifications	Details
Weight	LEDCube-C15: 7.0 kg (15.5 lb) | LEDStand (pair): 27.2 kg (60 lb)
LEDCube Dimensions	300 mm x 300 mm x 210 mm | Emitter dimensions: 270 x 270 mm
Fixture Dimensions	620 mm x 500 mm x 1873 mm (24.41" x 19.69" x 73.74")
Crate Dimensions	1816.1 mm x 622.3 mm x 482.6 mm (71.5" x 24.5" x 19")
Total Shipping Weight	91 kg (200 lb)
LED Channels	15 Channels
Spectral Range	350 – 700 nm
LED Lifetime	> 10,000 hours
Predefined Illuminants	Standard daylight D65, 050 CIE Ra: 33.85 < Grade A (< 0.25)
Tunable Range	CCT: 2000 – 20000 K, CIE Ra: 0 – 100, Duv: -0.02 – +0.02
Maximum Illuminance @ 1 m	D50: 1250 LUX | D65: 850 LUX
Short-term Stability	D65 < ± 10 K, D50 <± 5 K; luminance < 0.5%
Long-term Stability	D65 < ± 25 K, D50 < ± 15 K; luminance < 0.5%
Electrical	110 – 230 VAC



Jeti Specbos 2501-NIR Spectroradiometer

Miniaturized, fast, and versatile broadband spectroradiometer

Why Choose the Jeti Specbos 2501-NIR Broadband Spectroradiometer?

The Jeti Specbos 2501-NIR is a miniaturized and fast broadband spectroradiometer covering the wavelength range from 380 nm to 1000 nm. It can be used for various applications both in lab as well as in production and can measure in Radiance and in irradiance mode based on its NIST traceable calibration. Includes 90° diffuser to allow irradiance measurements perpendicular to the instrument. Compatible with Thouslite LEDNavigator software.

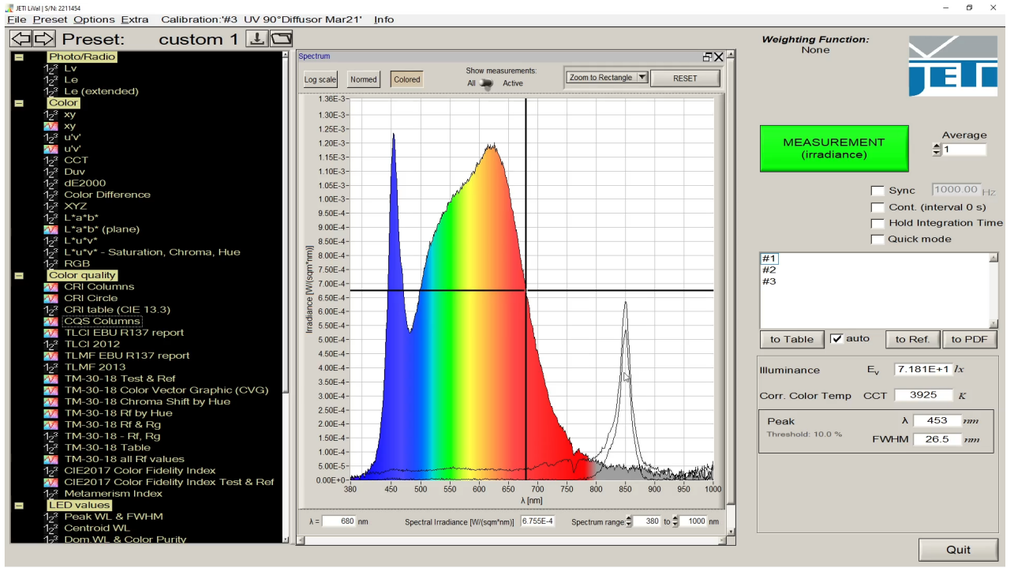
Jeti Specbos 2501-NIR Broadband Spectroradiometer Features:

- ✓ Wavelength range from VIS to NIR (380nm to 1000nm)
- ✓ Radiometric software JETI LiVal
- ✓ Optional 90° diffuser for irradiance measurements
- ✓ Measure luminance, radiance, illuminance, irradiatance, xy and u'v' coordinates, CCT, color rendering index, and more
- ✓ Spectral calculations, saving of reference spectra, and data export in CSV and XLS files
- ✓ Measurement also possible with DLLs or SCPI compatible commands
- ✓ Mechanical shutter for dark signal compensation
- ✓ Small and easy to use, yet highly sensitive
- ✓ NIST traceable calibration

J-specbos 2501-NIR-0deg

Jeti Specbos Broadband Spectroradiometer Specifications

Specifications	Details
Weight	1.0 kg (2.2 lb)
Dimensions	186 mm x 105 mm x 50 mm (7.32" x 4.13" x 1.97")
Operating Conditions:	10°-40° C | humidity < 85% | relative humidity at 35° C
Optical Resolution	Optical resolution (FWHM): 4.0 nm (2.0 nm for 2501-HiRes)
Measuring Range	0.2 – 150 000 cd/m² (illuminant A) 0.2 – 100 000 cd/m² (typical warm white LED) (higher values with optional filter)
Wavelength Resolution	1 nm
Digital Electronic Resolution	15 bit ADC
Viewing Angle	1.8° (luminance mode)
Measuring Distance / Diameter	20 cm – Ø6 mm; 100 cm – Ø31 mm (luminance mode)
Accessories Included:	PC software JETI LiVal for Windows 8.1/ 10, operating instructions and software development kit on BT stick, USB cable, battery charger and trigger connector, tripod, carrying case, protection cap



Radiometric software JETI LiVal (included)

Magnetic Chart Mounting System

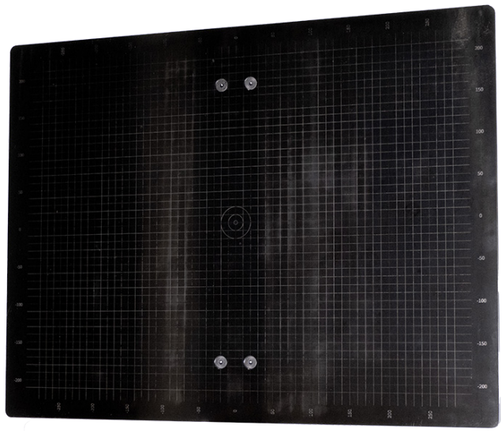
Configurable system for holding mounted charts with magnetic backing

Why Choose the Imatest Magnetic Chart Mounting System?

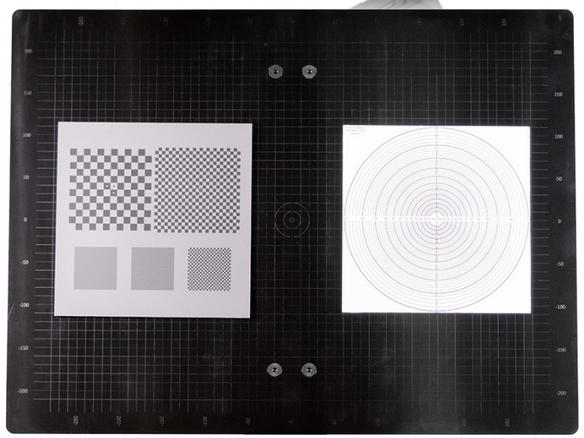
The Imatest Magnetic Chart Mounting System is a configurable system that allows you to easily display and exchange test targets. The full system includes the freestanding chart holder (stand) and magnetic chart plates (QTY of 1, 2 or 3). The plate can also be purchased separately for use with our MTS or BTS (including hardware for integrating with the fixture). Use with Imatest reflective targets mounted on ePanel with magnetic backing for easy integration. The magnetic chart holder grid includes 10 mm line spacing and numerical indicators at 50 mm intervals. The grid also includes concentric circles to aid in finding the center. The included digital angle finder allows you to easily check and change the angle of your charts.

Imatest Magnetic Chart Mounting System Features

- ✓ Rigid steel plate with black-oxide coating
- ✓ Laser engraved positioning grid
- ✓ Easily integrates with Imatest fixtures or 40 x 80 mm aluminum extrusions
- ✓ For use with mounted charts with magnetic backing
- ✓ Includes digital angle finder
- ✓ Compatible with Imatest Spectral Illuminance and Low Light Sensors

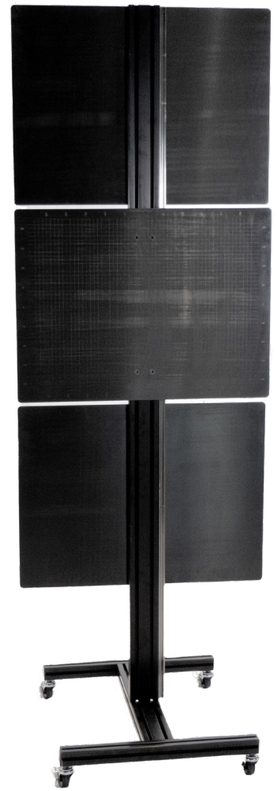


IMTS-R-KIT

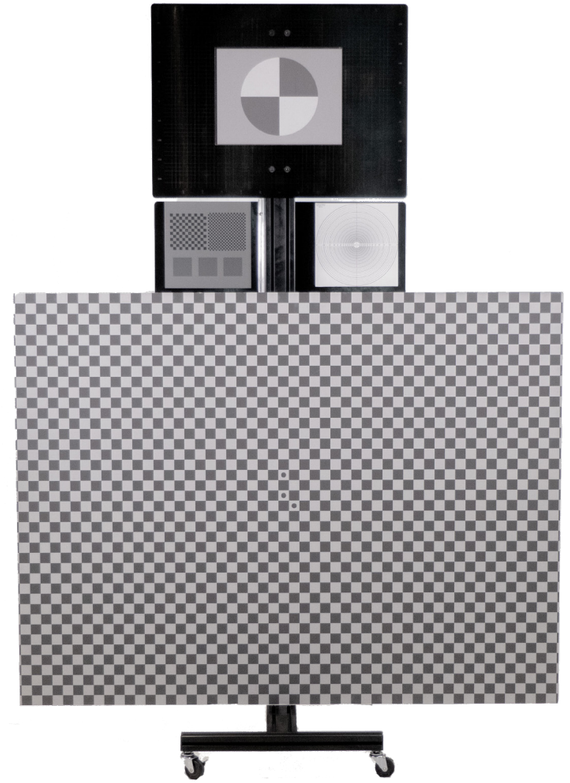


Magnetic Chart Mounting System Specifications

Specifications	Details
Mounting Plate Weight:	18.3 kg (40 lb)
Stand Weight:	9.3 kg (25 lb)
Mounting Plate Dimensions:	665 mm x 500 mm x 6 mm (26.18" x 19.69" x 0.24")
Stand Dimensions:	620 mm x 509 mm x 1960.5 mm (24.41" x 20" x 77.19")
Mounting Plate Grid Pattern:	10 mm spacing with number indicators every 50 mm
Mounting Plate Hole Pattern:	40 x 350 mm countersunk for M8 flathead screws
Maximum Recommended Chart Size:	1513 mm x 850.8 mm (59.6" x 33.5")
Mounting Plate Material:	A36 / ferrous mild steel with black oxide coating
Digital Angle Finder Resolution:	0.1°
Digital Angle Finder Accuracy:	± 0.2°



Imatest Freestanding Chart Holder



Imatest Freestanding Chart Holder

Imatest Spectral Illuminance Color Sensor

Measure illuminance, color temperature, CRI, & visible spectrum

Why Choose the Imatest Spectral Illuminance Color Sensor?

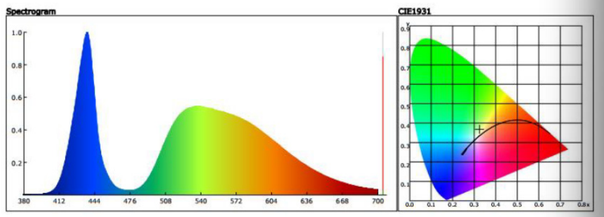
The Spectral Illuminance Sensor enables quick, accurate measurements over a USB interface. Quickly measure Correlated Color Temperature (CCT), illuminance (LUX), and photosynthetic photon flux density (PPFD). The included adapter allows you to easily mount the spectral sensor to the Imatest Modular Test Stand, Sensor Plate, Magnetic Chart Mounting System, or other ferrous materials. Separate the transmitter and receiver for wireless communication.

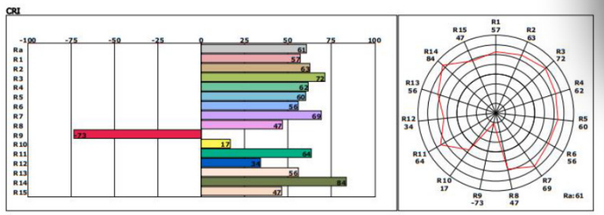
Imatest Spectral Illuminance Color Sensor Features

- ✓ Measures Correlated Color Temperature (CCT), illuminance (LUX), and photosynthetic photon flux density (PPFD)
- ✓ Can measure wide and narrow spectrum light sources, such as CFL, HID, etc.
- ✓ Includes adapter with 1/4”-20 tripod mount and embedded magnet for mounting to the Imatest Sensor Plate
- ✓ Includes PC control software

Parameter

Name	Value	Name	Value	Name	Value
L(cd/m²)	6150.40	Purity(%)	8.0	Compensate level	2890
Footlamber (fl)	1795.06	HalfWidth(nm)	20.9		
CCT(K)	5809	Peak(nm)	437.5		
Duv	0.01627	Center(nm)	435.5		
CIE x,y	0.3245,0.3673	Centroid(nm)	532.3		
CIE u,v	0.1920,0.3261	Color Ratio(RGB)	10.9,87.7,1.3		
CIE u',v'	0.1920,0.4891	CIE1931 X	7955.053		
SDCM	11.07	CIE1931 Y	9004.982		
Ra	60.8	CIE1931 Z	7554.475		
Le(mW/cm²/sr)	1.781	Integral Time(ms)	7		
S/P	1.785	Peak Signal	55706		
Dominant(nm)	539.10	Dark Signal	1688		





Spectral Illuminance Color Sensor Specifications

Specifications	Details
Illuminance Range	5-200,000 LUX
FWHM	4 nm
CCT Range	1000 – 100,000 K
Spectral Resolution	0.5 nm
Sensor	CCD | 1500 sensor array points
Zeroing Mode	Auto zeroing
Wave Accuracy	± 0.5 nm
Chromaticity Coordinates (x,y)	Accuracy: ± 0.0025 | Repeatability: ± 0.0025
Illuminance Accuracy	± 4%
Window Size	Ø17 mm
Interface	USB-C
Sensor Dimensions	61.2 mm x 63.0 mm x 17.2 mm (2.41" x 2.48" x 0.675")
Sensor + Mounting Adapter Dimensions	67.3 mm x 72.1 mm x 24.1 mm (2.65" x 2.84" x 0.95")
Control Software	Windows HPCS330X software | Serial interface

Imatest Low Light Illuminance Sensor

Measure illuminance (LUX) between 0.1 and 200,000 LUX

Why Choose the Imatest Low Light Illuminance Sensor?

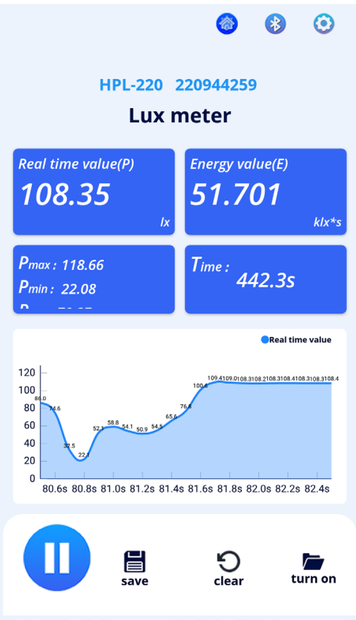
The Low Light Illuminance Sensor enables quick, accurate measurements over a USB interface or using a bluetooth connected readout unit. Includes an adapter for mounting to a 1/4”-20 tripod mount or magnet for mounting to the Imatest Sensor Plate, Magnetic Chart Mounting System, or other ferrous materials. Includes a windows GUI for control of a single device and an android GUI for control of a multiple devices.

Imatest Low Light Illuminance Sensor Features

- ✓ Measure incident light illuminance in LUX
- ✓ Sensor and readout device connected by Bluetooth interface
- ✓ Includes adapter with 1/4”-20 tripod mount and embedded magnet for mounting to the Imatest Sensor Plate
- ✓ Includes PC control software

Low Light Illuminance Sensor Specifications

Specifications	Details
Illuminance Range	0.1-200,000 LUX
Resolution <10 LUX	0.01 LUX
Resolution (10,10,000) LUX	0.1 LUX
Resolution >10,000 LUX	1 LUX
Sensor	CCD
Wavelength Range	380 – 780 mm
Zeroing Mode	Manual
Illuminance Accuracy	± 5%
Window size	Ø12 mm
Interface	Bluetooth, micro-USB
Sensor Dimensions	38 mm x 38 mm x 22 mm (1.5” x 1.5” x 0.87”)
Mounting Adapter	Magnetic and 1/4”-20 tripod mount
Sensor + Mounting Adapter Dimensions	44 mm x 44 mm x 38 mm (1.73” x 1.73” x 1.5”)
Single Device GUI software	Windows
Communication Protocol	Serial interface



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