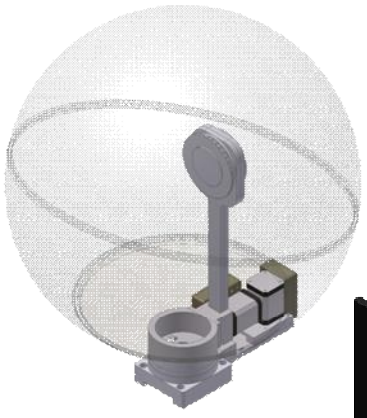
September 2009

Gigahertz-Optik

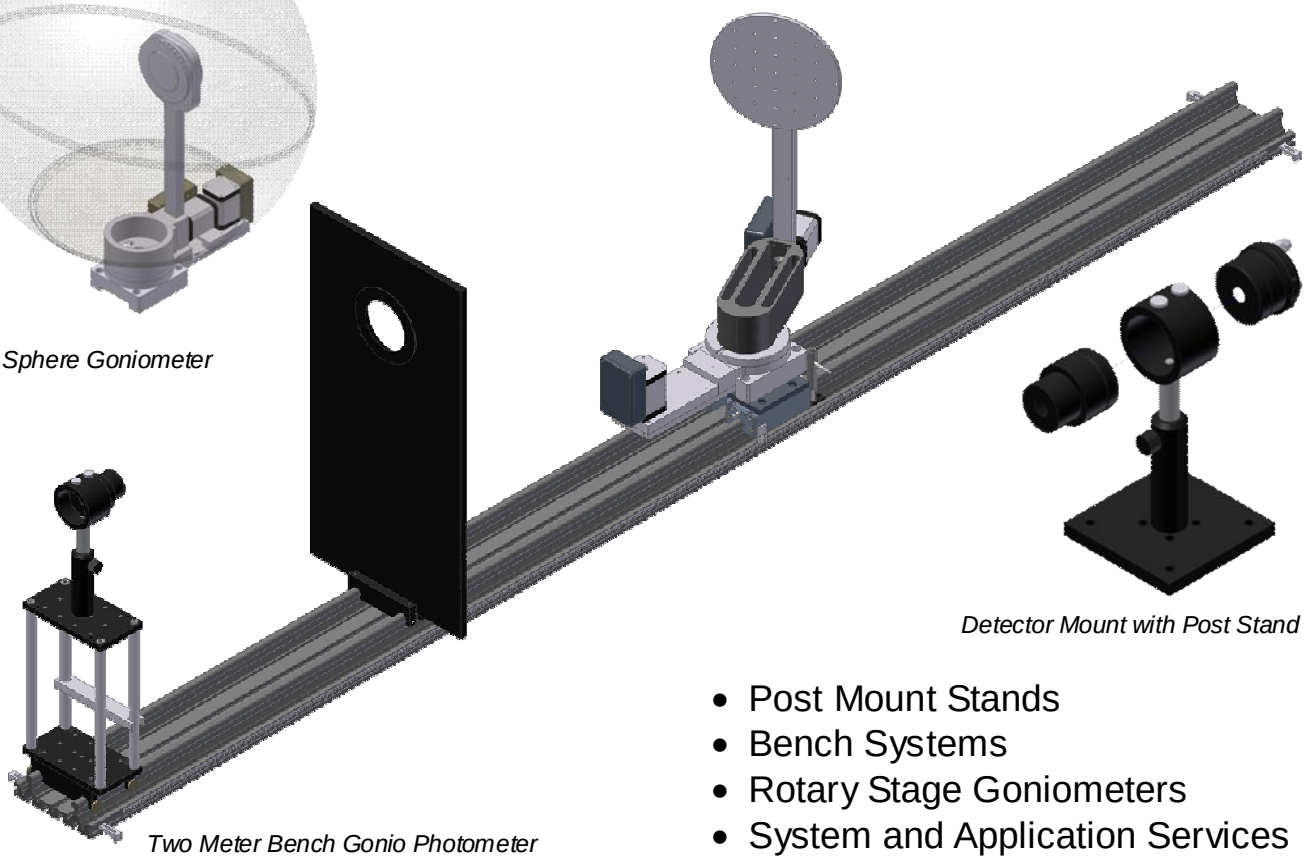
Measurement of Light

Measurement with Light

Mechanics and Stages for Light Measurement Applications



Sphere Goniometer



Two Meter Bench Gonio Photometer

Detector Mount with Post Stand

- Post Mount Stands
- Bench Systems
- Rotary Stage Goniometers
- System and Application Services

Mechanics and Stages for Light Measurement Applications

In many light measurement applications the device under test and light detector must be precisely aligned with respect to each other. In goniometric measurement applications, e.g. spatial luminous intensity distribution measurements of luminaries, precise angular rotation of the DUT about a fixed reference axis is required. The Mechanics and Stages supplied by Gigahertz-Optik GmbH enable the user of our light measurements instruments to create complete measurement set ups for manual or remote controlled applications. Beside the standard components shown in this datasheet new product developments are always in process keeping pace with customer demand. Our AUTOCAD based design department supports component and system solutions works in close cooperation with our special product machine workshop and custom CNC machining center to produce both standard and custom parts to offer the most flexible and short lead time solutions. Gigahertz-Optik GmbH's technical project team supplies complete measurements set-up solutions based on our light measurement instrumentation and accessories.

Since light measurement application set-ups tend to be complex this datasheet only supplies general product highlights and service information. For more detailed information and to discuss your specific requirements please contact the factory or your local representative.

Gigahertz-Optik GmbH

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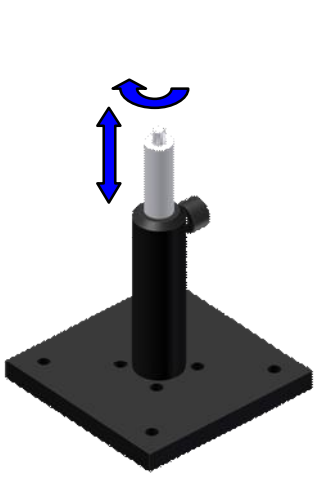
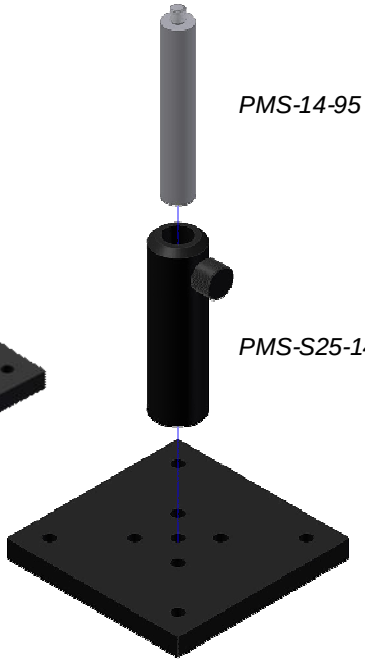
PMS - Post Mount Stands



PMS-14-95



PMS-S25-14

PMS-BP-100

UMBB-150 Type Integrating Sphere

PMS-DM45 Detector Mount

Post Mount Stand Application Examples

Post mount stands are the most simple and flexible tools to supply a stable and adjustable fixture for detector heads and other optical bench components. Posts are supplied in different lengths and fixed in post holders that allow fine height and axial adjustment of the device assembled onto the post. The post holders can be assembled onto base plates available in different diameters or square shaped for use on optical or work benches. Additional adapters enable integration of the post mounts into custom made measurement set-ups.

PMS-P14-xx Posts:

Stainless steel 14mm diameter mounting posts supplied in different lengths. Includes M6 stud.

Standard Length	Custom Length
PMS-14-95	PMS-14-xx
PMS-14-300	xx in mm; max. 300mm

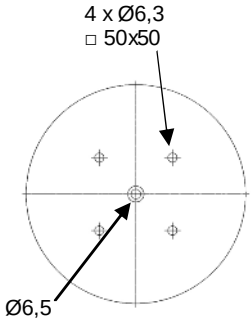
PMS-S25-14 Post Holders:

Post holder locking thumbscrew for 14mm diameter posts. M6 threaded hole for assembly to base or adapter plate.

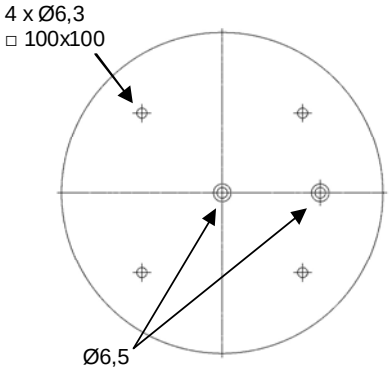
PMS-B-xx and PMS-BP-xx Base Plates:

Base plate for use with post mount stands or for application integration. Center hole for assembly to PMS-S25-14 with M6 screw. Through holes in pattern for user set-ups.

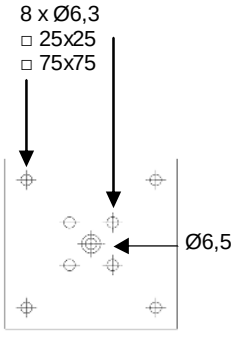
Disk Shape	Description
PMS-B-150	150mmØ;
PMS-B-200	200mmØ
Square Shape	
PMS-BP-100	100x100mm
PMS-BP-100-LTE	For use with LTE



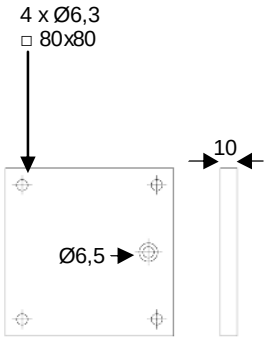
PMS-B-150



PMS-B-250

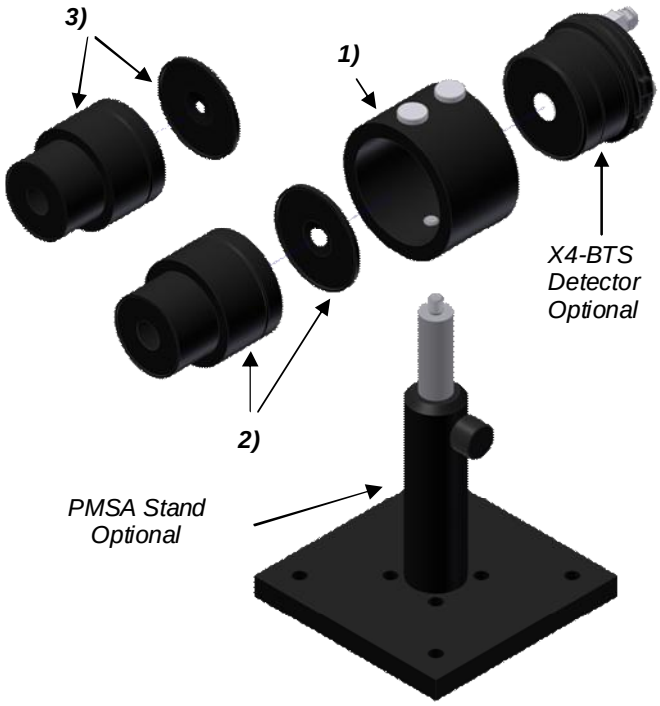


PMS-BP-100



PMS-BP-100-LTE

PMS - Post Mount Accessories



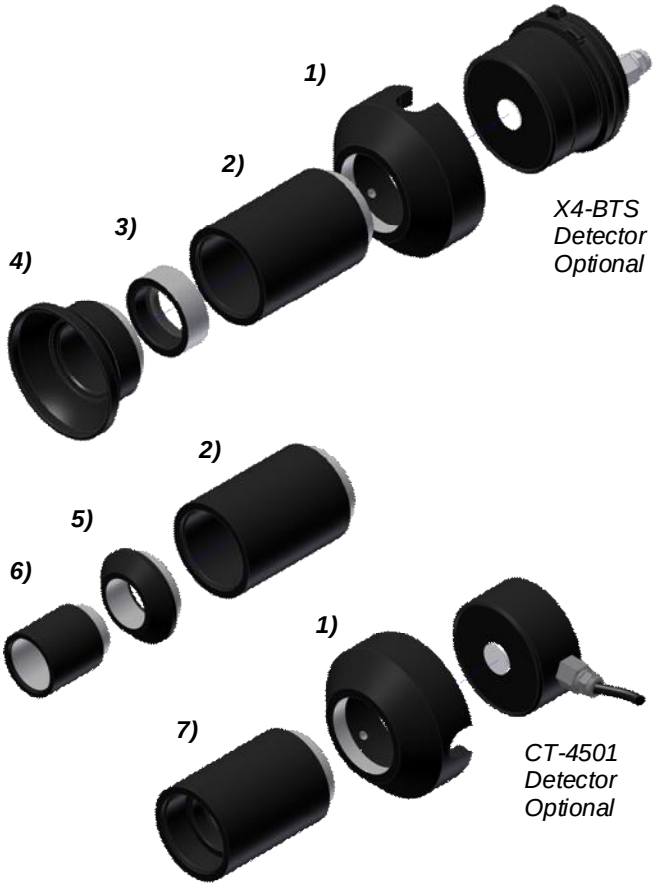
Detector Mounts for Post Mount Stands:

PMS-DM45 series adapters to mount Gigahertz-Optik light detectors with 45mm detector housing diameters to post mount stands. Front tube adapters allow reduction of the detector measurement area.

PMSA-DM45 (1): Detector Mount for 45mm diameter detector heads, e.g. X4-BTS and CT-4501. Locking thumbscrew for detectors with a 10mm distance to front V-groove. Front interface for PMSA-DM45-xx aperture adapter with locking thumbscrew.

PMSA-DM45-100 (2): Aperture adapter with 100mm² (11.28 mm diameter) aperture. V-groove for precise fixturing with PMSA.DM45 locking thumbscrew.

PMSA-DM45-20 (3): Aperture adapter with 20mm² (5.05mm diameter) aperture. V-groove for precise fixturing with PMSA.DM45 locking thumbscrew.



SRT-M37 series of all-purpose front tubes adapters for field-of-view reduction, with lenses for luminance measurements applications and other individual set-ups.

SRT-M45/37B (1): Adapter/holder to mount 45 and 37 type detectors to post mount stands and combine with SRT-M37 type components. Front with M37x1 thread. M6 and 1/4-29BSW threaded mounting holes.

SRT-M37-25 and -50 (2): Tube with 37mm dia., 25mm or 50mm length and male and female M30x1 thread.

SRT-M37-OH (3): Adapter for use in SRT-M37-50 to mount lenses, filter etc.

SRT-M37Z-01 (4): Ambient light shade made by elastic rubber for SRT-M37-L front lenses or SRT-M37-50 tubes.

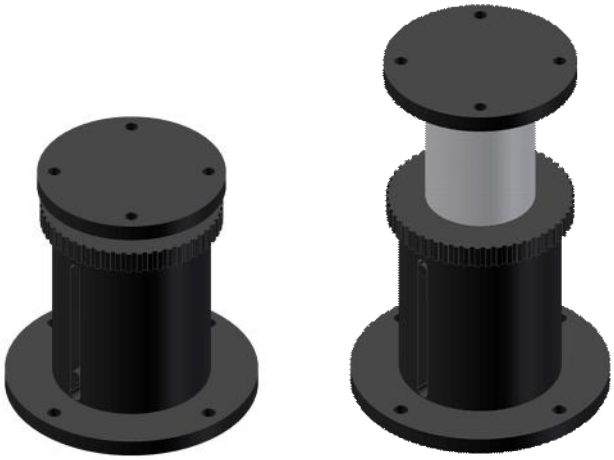
SRT-M37-AP: Aperture plate to glue into SRT-M37-50. 2mm diameter center hole.

SRT-M37/M20 (5): Adapter to mount M20 tubes to M37 adapters.

SRT-M20-25 (6): Tube with 25mm dia. and 25mm length and M20x1 thread.

SRT-M37L-xx (7): Luminance/radiance front lens adapter with xx° (xx= 1°, 2°, 5° or 10° field of view for detectors with >=10mm dia.. Glass or quartz lenses are offered.

PMS - Post Mount Accessories



PMS-TSZ in Lower and Upper Position

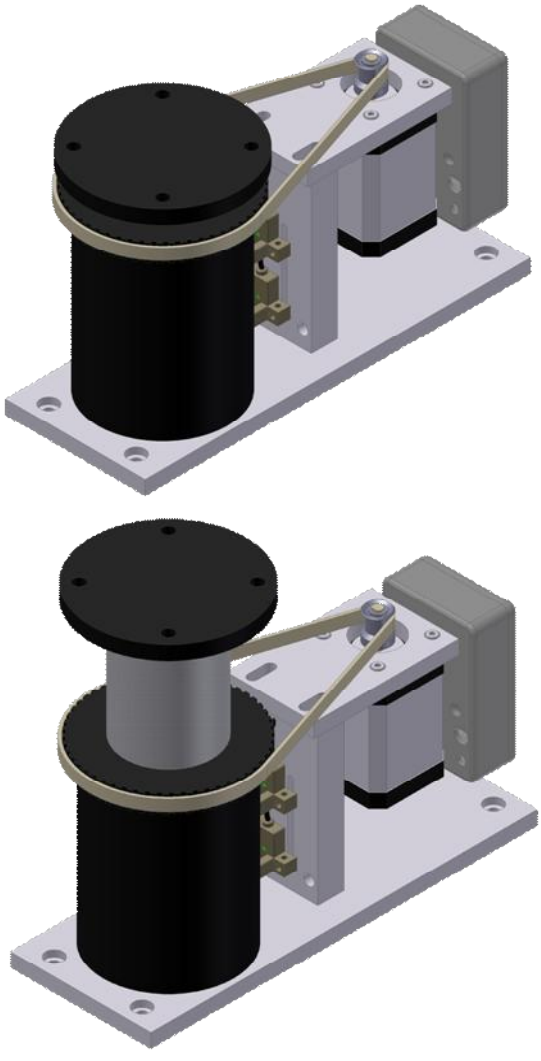
PMS Height Adjustment Stages:

For precise heavy load height adjustment and positioning Gigahertz-Optik offers PMS Z-axis stages. Both manually driven and remote controlled versions are supplied.

PMS-TSZ: Z-axis stage for manual height adjustment and positioning of heavy load devices, e.g. Integrating sphere light sources.

Specification:

Minimum Height: 120mm
Maximum Height: 185 mm
Resolution: 2.2µm
Maximum Load: 10 kg



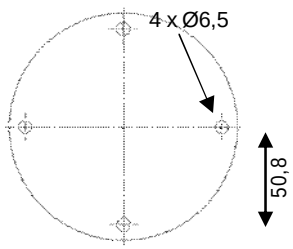
PMS-TSZ-RS in Lower and Upper Position

PMS-TSZ-RS232: Z-axis stage with stepping motor drive for remote control height adjustment and positioning of heavy load devices. Integrated stepping motor controller with RS232 interface.

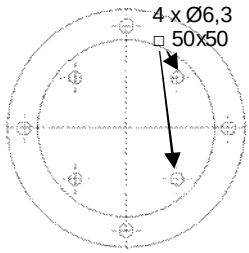
PMS-TSZ-RS485: Z-axis stage with stepping motor drive for remote control height adjustment and positioning of heavy load devices. Integrated stepping motor controller with RS485 interface.

Specification:

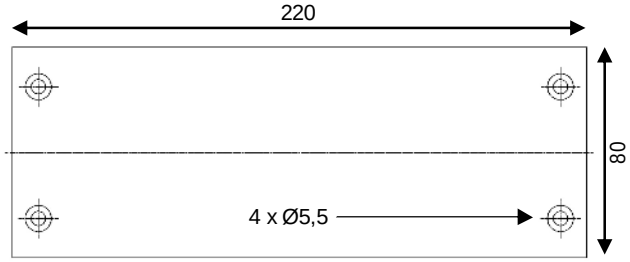
Minimum Height: 120 mm
Maximum Height: 185 mm
Resolution: 2.2µm
Maximum Speed: 2mm/s
Maximum Load: 10 kg
Operation Voltage: 7-28V/DC



PMS-TSZ Bottom View

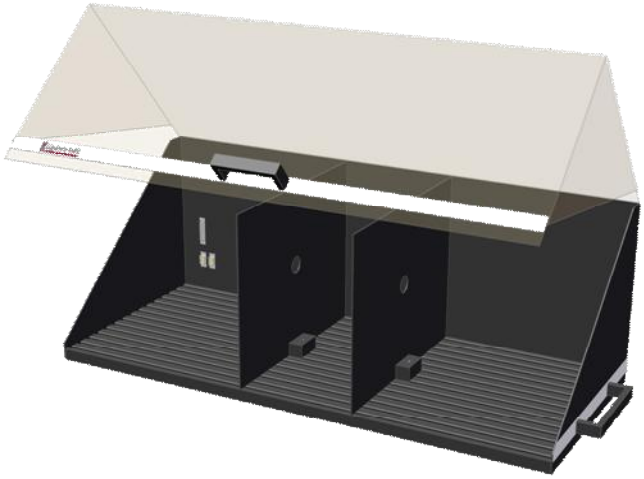


PMS-TSZ Top View



PMS-TSZ-RS Bottom View

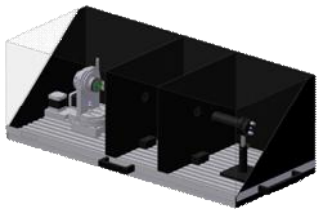
LTE Light-Tight Enclosure Bench



LTE Device with Open Lid

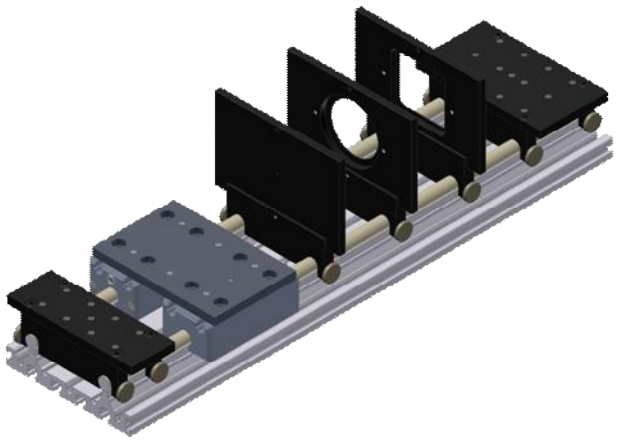
For measurement applications outside the darkroom Gigahertz-Optik offers the LTE light-tight enclosure bench. The T-Nut type platform allows flexible assembly and positioning of benches, e.g. B2S-75 or goniometer and detector heads with adapter plates. The LTE light-tight enclosure includes a full length easy open/close lid with catch to maintain the open position.

Specifications	
Width	990mm
Depth	420mm
Height	340mm
Weight	15.5kg



LTE with LED GB and X4

B2S-75 Bench System

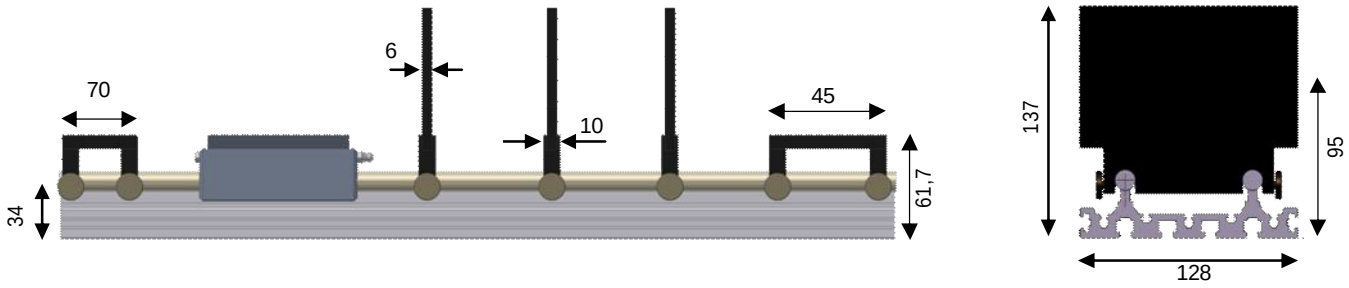


B2S-75 Bench System

For precise and flexible alignment Gigahertz-Optik GmbH supplies a two rail bench system. The stable bench with steel rails and aluminum profile base is supplied in lengths from 500 to 2000mm. Different kinds of supports, fixed carriers and linear motion carrier support individual light measurement set-ups.
B2S-75-Bxx: Two rail bench as base for individual application set-ups. Two steel rails with 75mm gage assembled on aluminum profile base.

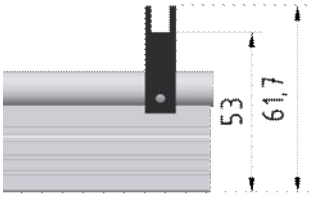
B2S-75-B-Z01: Set of four clamps to fix the B2S-75-B bench to optical benches and breadboards.

Model	**Length**	**Weight**
B2S-75-B298	298mm	1.5kg
B2S-75-B498	498mm	3.0kg
B2S-75-B998	998mm	5.0kg
B2S-75-B1998	1998mm	10.0kg
B2S-75-Bxx	xx up to ..mm	

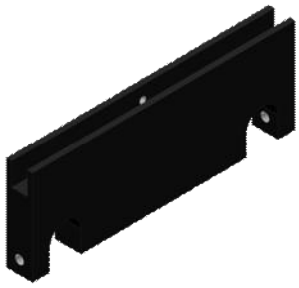


B2S-75 Bench and B2S-75 Accessory Profile

B2S-75 Bench System



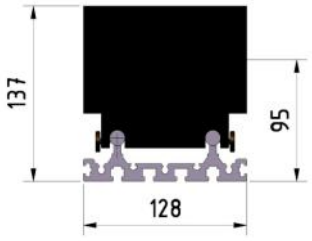
B2S-75-SG on B2S-75-B in Side View



B2S-75-SG

B2S-75-: Carriers and Stages

2S-75-SG: Support with top channel to mount B2S-75-SGP adapter plate

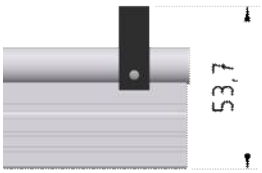


B2S-75-SG+SGP on B2S-75-B

B2S-75-SGP-01

B2S-75-SGP: Plates for use with B2S-75-ST. The plates can be modified by end-user machining with aperture holes, lens adapters as needed. Gigahertz-Optik also offers custom machining and complete application services.

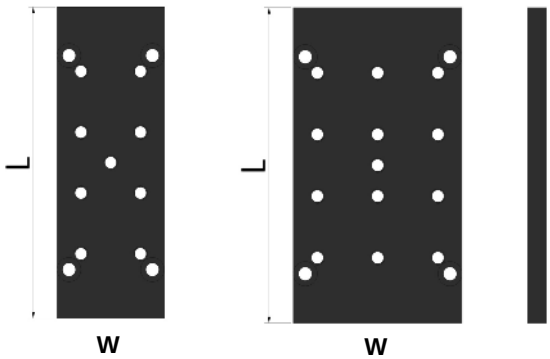
Model	Specifications
B2S-75-SGP-01	n x n mm non machined
B2S-75-SGP-CUS	Custom Made Size



B2S-75-ST on B2S-75-B in Side View

B2S-75-ST

B2S-75-ST: Support with threaded hole pattern to allow assembly of B2S-STP platform adapters and other parts.

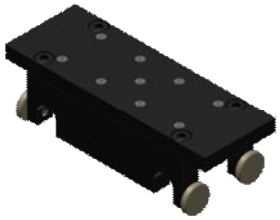


B2S-75-STP-45 *B2S-75-STP-70*

B2S-75-STP: Platform adapter for use with B2S-75-ST support and other parts.

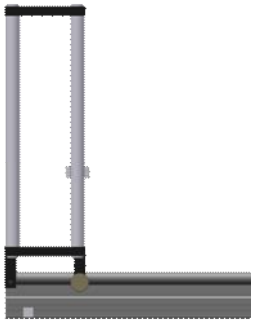
Model	Length	Width
B2S-75-STP-45	128mm	45mm
B2S-75-STP-70	128mm	70mm

B2S-75 Bench System

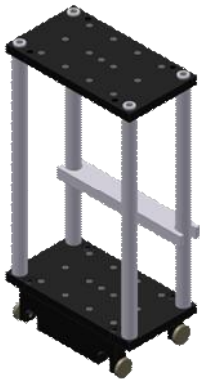


Carrier B2S-75-C-45

B2S-75-C-70



B2S-75-C200 on B2S-75-B in Side View

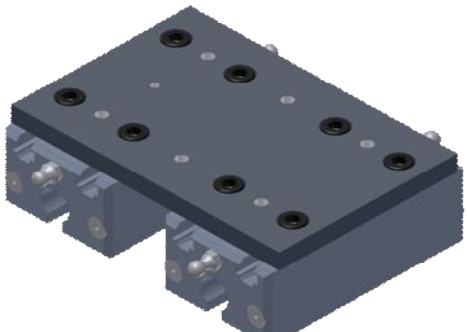


B2S-75-C-70-200

B2S-75-C: Carriers for use with B2S-75-B bench are available in two widths and two heights. All offer a threaded hole pattern on top to assemble PMS stands and other parts.

The **B2S-75-C70-200** carrier includes a second platform 200mm above the base platform. The recommended application is goniometer measurement set-ups with GB-GD-350.

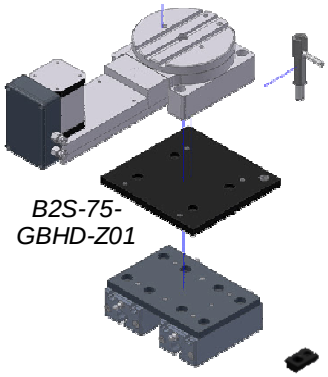
Model	Length L	Width	Height [1)]
B2S-75-C-45	128mm	45mm	61.7mm
B2S-75-C-70	128mm	70mm	61.7mm
B2S-75-C-70-200	128mm	45mm	270mm
1) assembled to B2S-75-B			



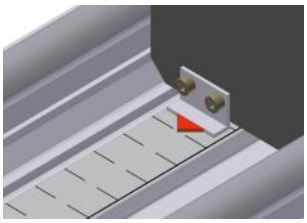
B2S-75-LMC85

B2S-75-LMC85: Linear motion carrier for use with B2S-75-B bench. Ball bearing slide for heavy load tilt free motion.

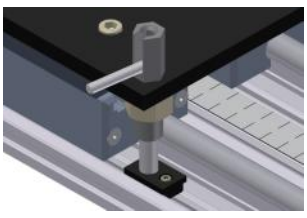
Model	Length L	Width	Height [1)]
B2S-75-LMC85	128mm	..mm	61.7mm
Maximum Load: F_1 static - 420kg;F_1 dynamic - 240kg			
1) assembled to B2S-75-B			



B2S-75-GBHD-Z01



B2S-75-B-Z02 and –Z03



B2S-75-B-Z02 and –03

B2S-75-GBHD-Z01 with optional B2S-GBHD and B2S-75-LMC85

Accessories for B2S-75-LMC85:

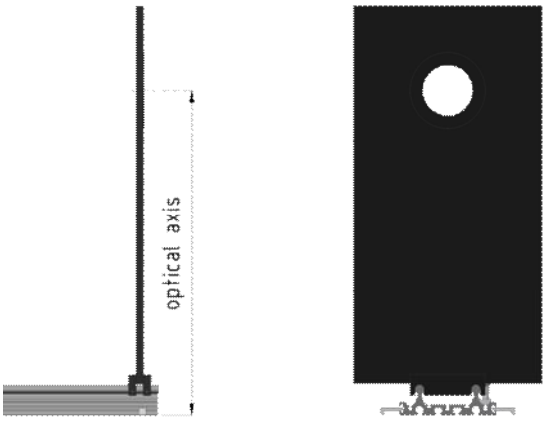
B2S-75-B-Z02-xx: Millimeter scale with adhesive backing for taping onto B2S-75-B bench. Length xx specifies bench length.

B2S-75-B-Z03: Arrow pointer to support precise positioning

B2S-75-GBHD: Adapter plate to mount the GB-HD goniometer horizontal drive or types to the top of the B2S-75-LMC85 linear motion carrier.

B2S-75-GBHD-Z01: Positioning set for B2S-75-GBHD adapter plate. The set consist a B2S-75-B-Z02-xx millimeter scale, arrow pointer and free positioning stopper device. Length xx to be specified for bench length.

B2S-75 Bench System



B2S-75-SAP300

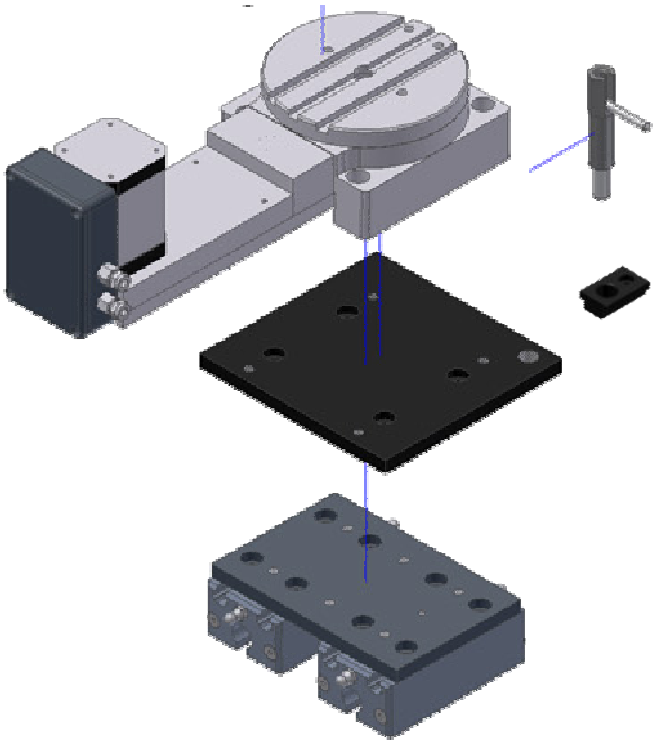
B2S-75-SAP300: Support with aperture plate for use in GB-GD300 goniometer set-ups Optical axis is 300mm in height. Plug-in aperture mount with tbx. mm aperture diameter.

Plate size: 500mm x 250mm

GB - Goniometer

GB-GD150 Goniometer with LED Measurement Adapter

Goniometer drives allow precise angular adjustment of a light source, display or object to a fixed reference axis. This makes possible the measurement of spatial intensity distribution, e.g. spatial luminous intensity distribution, spatial luminance distribution and spatial reflection distribution. Typically most light measurement applications goniometric measurement set-ups require a high degree of freedom in system configuration. This is because of different light characteristics, e.g. self emitting, reflective, spot source, area source and the dimensions of the test sample. Gigahertz-Optik has developed goniometer drives with accessories for stand alone use and application integration. A simple to use and cost effective goniophotometer for use in and outside the dark-room has been developed as well as goniometric measurement devices for contrast measurement and inspection in hemispherical illumination conditions. All applications are remote controlled. Gigahertz-Optik's tested and proven belt driven rotary table type design provides fast and quiet operation.



The Horizontal Drive GB-HD can be Integrated into B2S-75 Bench set-ups with optional adapters

Goniometer in Modular Design:

The modular concept of Gigahertz-Optik's goniometer is based on a horizontal drive (Phi Axis) witch can be combined with different types of axial drives (Theta Axis).

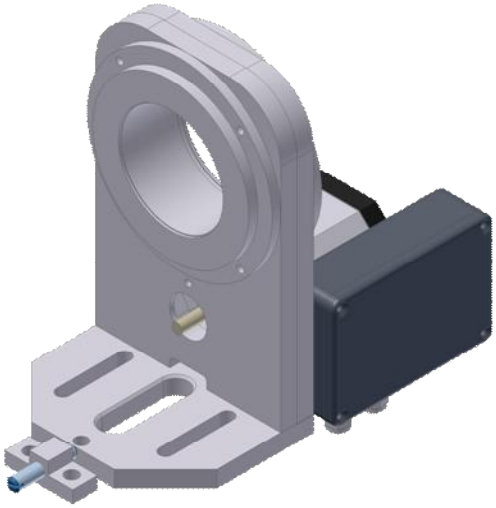
GB-HD: Horizontal Drive (Phi Axis) as base for two axis goniometer drives or stand alone applications. Rotary table interface for direct assembly of GB-AD100. Stepping motor drive with toothed belt for fast and quiet operation. The stepping motor control electronic box is assembled to the stepping motor housing to avoid long cable runs The electronics housing supplies interfaces for DC voltage and RS232 or RS248.

Model	Specifications
Maximum Rotary Range:	+/- 90°
Maximum Rotary Resolution:	0.1°
Reproducibility:	0.2
Maximum Load:	5kg
Operation Voltage:	24V DC
Interface:	RS232 or RS485

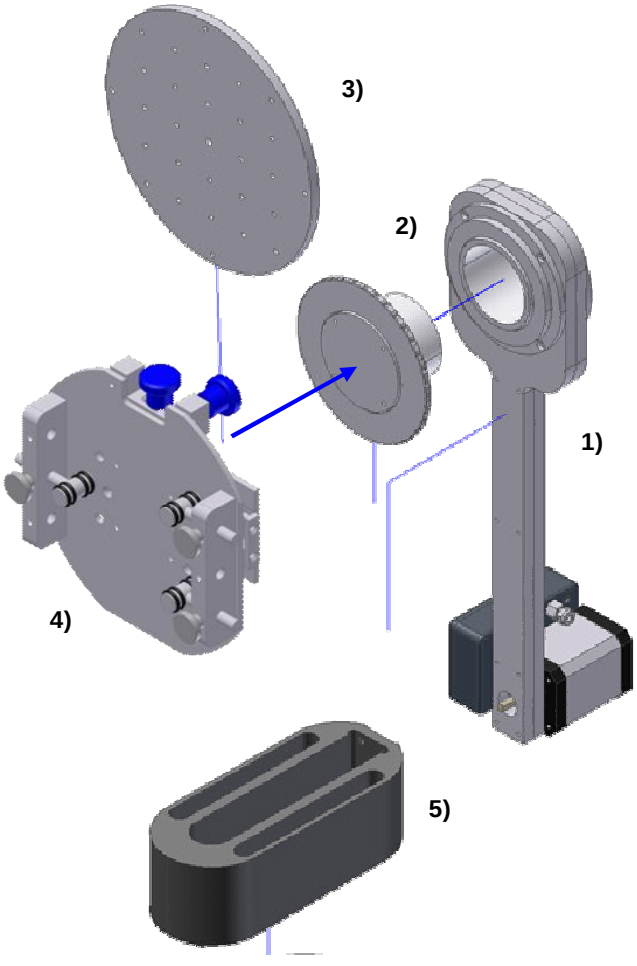
Ordering Information:

GB-HD-RS232: RS232 Interface
GB-HD-RS485: RS485 Interface

GB - Goniometer



Axial Drive GB-AD-100 for LEDA Adapter



All-purpose Axial Drive GB-AD-300 (1) with Accessories

Axial Drives:

GB-AD-100: Axial Drive (Theta Axis) for two axis goniometer drives combine with GB-HD or stand alone use. Direct mount to GB-HD rotary table. Axial rotary table with interface for Gigahertz-Optik's LEDA LED measurement adapter. Stepping motor drive with toothed belt for fast and quiet operation. The stepping motor control electronics box is assembled to the stepping motor housing to avoid long cable runs. The electronics housing supplies interfaces for DC voltage and RS232 or RS248.
Ordering Information:
GB-AD100-RS232: RS232 Interface
GB-AD100-RS485: RS485 Interface

GB-AD300: Axial drive (Theta Axis) with all purpose adapter interface for different kinds of goniometric applications. Stand alone use or combine with GB-HD for two axis goniometer applications. Universal rotary axis adapter with integrated Z-axis drive and adapter to mount and fix test samples are offered. Stepping motor drive with toothed belt for fast and quiet operation. The stepping motor control electronics box is assembled to the stepping motor housing to avoid long cable runs. The electronics housing supplies interfaces for DC voltage and RS232 or RS248. Ordering Information:
GB-HDD100-RS232: RS232 Interface
GB-AD100-RS485: RS485 Interface

Accessories for GB-AD300:

GB-AD-300-Z (2): Z-Axis stage adapter for GB-AD300 for fine positioning of test device to the goniometric reference axis. Travel range +/- 5mm with <0.01mm resolution

GB-AD-300-T (3): Universal test device assembly plate for use with GB-HD-300-Z. M4 hole pattern with M6 center hole

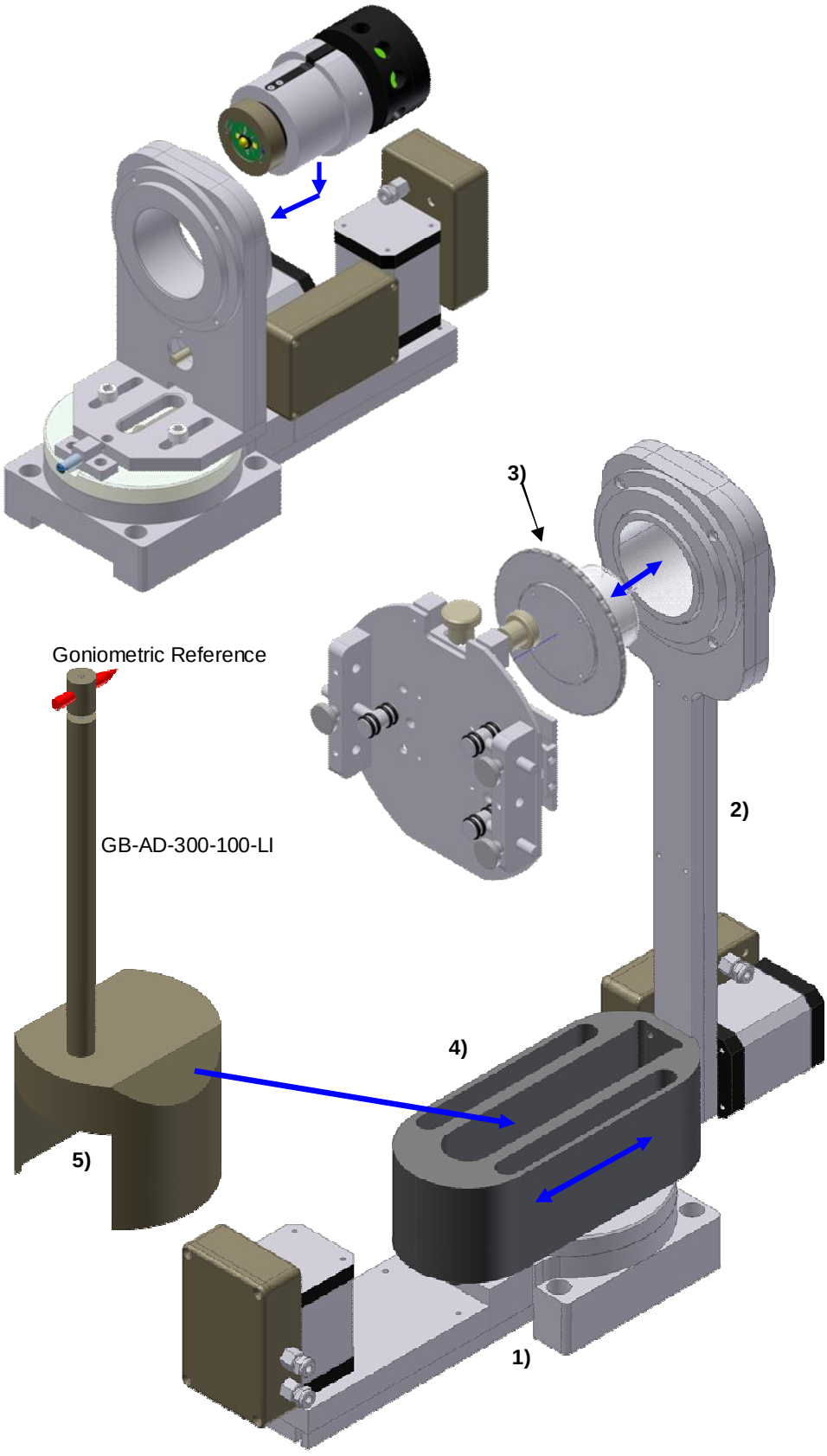
GB-AD-300-XYA (4): Universal test sample clamp holder for GB-AD-300-Z with manual X, Y and Alpha driven stages for precise DUT alignment to goniometric reference axis

GB-ADHD-100 (5): Adapter to assemble GB-HD-300 to GB-AD to allow the distance between the goniometric reference axis and the reference plane of the rotary table to be varied up to 100mm

Specifications: GB-AD100 and GB-AD300:

Model	Specifications
Maximum Rotary Range:	+/- 180°
Maximum Rotary Resolution:	0.2°
Reproducibility:	0.4°
Maximum Load:	1 kg
Operation Voltage:	24V DC
Remote Control Interface:	RS232 or RS485

GB - Goniometer



GB-GD-150:

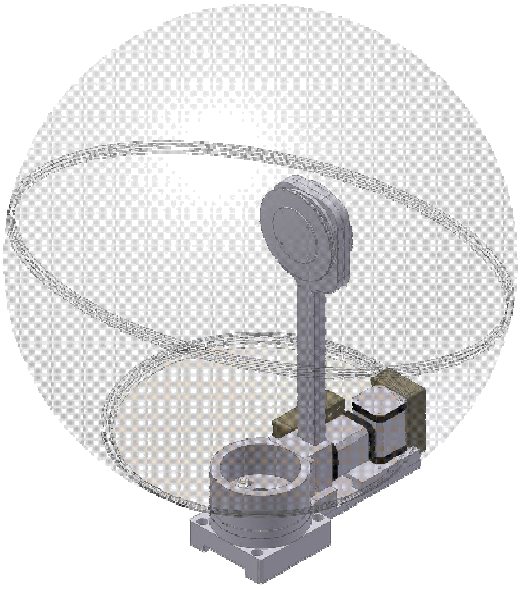
Configuration example of two axis goniometer drive for use with LEDA LED measurement adapters. The device consists of the GB-HD horizontal drive and GB-AD-100 axial drive. The optical axis is 150mm above the bottom reference plane. The adjustable distance of reference plane - back side of rotary table - to the goniometric axis is 50mm +/-10mm. Both axis are operated by remote control via the selected interface RS232 or RS485.

The **PMS-BP-100-LTE** adapter plate enable direct assembly of GB-GD-150 d to the T-Nut base plate of the LTE light-tight enclosure box.

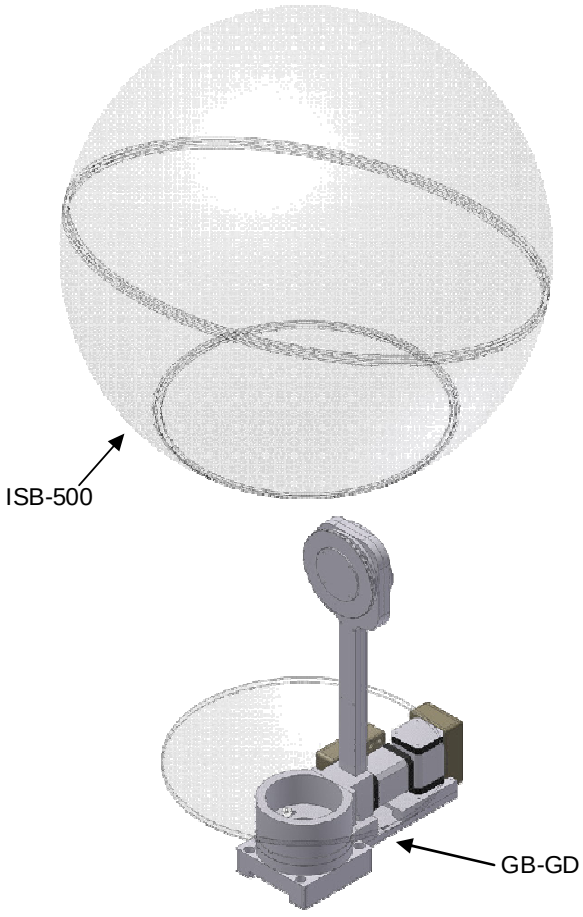
GB-GD-360:

Configuration example of all purpose two axis goniometer drive. The device consists of the **GB-HD** horizontal drive (1) and **GB-AD-300** axial drive (2). The optical axis is 360mm above the bottom reference plane. The optional **GB-AD-300-Z** adapter (3) for the rotary table permits a fine adjustment of Z axis with +/- tbc. mm travel. For test samples with different thicknesses the **GB-ADHD-100** (4) offers 100mm rough adjustable travel. Both axis are operated by remote control via the selected interface RS232 or RS485.
The optionally available sample holder supports test sample mounting and alignment to the goniometric reference axis.
GB-AD-300-T with threaded hole pattern.
GB-AD-300-XYA offers three clamps for mounting sample and fine resolution xy and alpha angle adjustment drives.
B2S-75-GBHD adapter plate is used to assemble the goniometer to B2S-75 bench application set-ups.
GB-AD-300-100-LI (5) is a tool to support alignment of test samples to the goniometric reference axis. Used on GB-AD-300-100.

GB - Goniometer



GB-IS-500 in Measurement Position



GB-IS-500 in Test Sample Loading Position

GB-IS-500 Integrating Sphere Goniometer:

The most common application for goniometers is their use in goniophotometric set-ups to measure the spatial luminous intensity distribution of light sources. A niche application is measurement of the spatial contrast of displays and spatial color impression of plastics and other materials. Both application types require a light source with uniform diffuse illumination independent of the goniometer orientation. To simulate daylight a hemispherical illumination of the test sample is required. For this condition the best place to mount the test device is in the center of an integrating sphere light source.

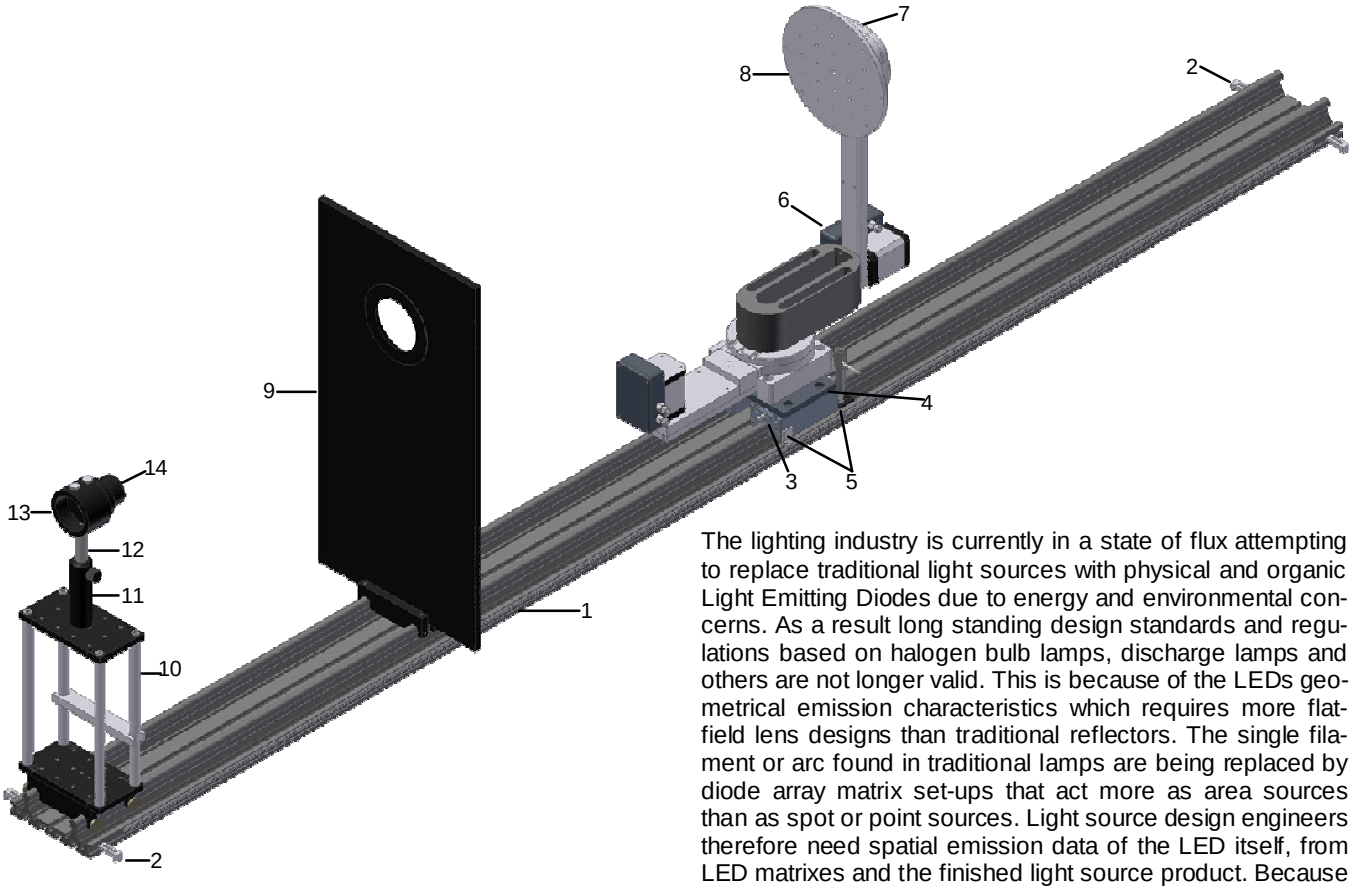
The GB-IS-500 goniometer consists of a two axis goniometer device similar to GB-GD-360 combined with a US-500 type integrating sphere. The goniometer offers full 360° Theta and 180° Phi orientation of the test sample in relation to a measurement port in the sphere wall. A luminance meter can measure the spatial luminance of the test device or the port can be used by an observer to assess the spatial color impression. The measurement port can be combine with a second port with exchangeable light trap and port plug for evaluations with and without gloss.

The integrating sphere is used as light source offering uniform diffuse test sample illumination independent of the goniometer orientation. To accomplish this a light source needs to be integrated so that direct illumination of the test sample is avoided. In display contrast measurement the display luminance can be controlled under fixed illuminance conditions to evaluate the contrast. Observer type evaluations require the illuminance level to be controlled. Gigahertz-Optik offers different kinds of light sources for use with their integrating spheres. The integrating sphere itself is one of Gigahertz-Optik's **US series integrating spheres** featuring the minimal possible gap between the two hemispheres to reduce shadowing and measurement error. The 5mm thick wall of this type sphere permits precision machining of a the goniometer port. This port is closed with a sphere segment, assembled to the Phi axis drive, if the goniometer is placed in the center of the sphere. Another important feature is the ability to move the goniometer sample holder out of the sphere to facilitate test sample assembly and alignment and also reduce the risk of soiling the sphere coating. The sphere coating is Gigahertz-Optik's ODP97 barium sulfate paint.

Beside the GB-ISS-500 integrating sphere goniometer Gigahertz-Optik offers complete contrast measurement and observer system set-ups including fixed or variable intensity light sources, reference detectors, luminance meters and light analyzers. A complete factory turn-key set-up is recommended for those end-users with no practical experience in design and set-up of complex integrating sphere devices. Set-up examples are available on the following pages.

Application Example GB-B2S-75-2m

All-purpose Goniometer Bench



GB-B2S-75-2m Parts List		
Item	Model	Description
1	B2S-75-1998	2m length bench
2	B2S-75-B-Z01	Set of 4 units down clamps
3	B2S-75-LMC85	Linear motion carrier
4	B2S-75-GBHD	Adapter plate for goniometer
5	B2S-75-GBHD-Z01	Positioning set with mm scale, arrow pointer and positioning stop
6	GB-GD-360	Two axis goniometer drive
7	GB-AD-300-Z	Z-axis stage adapter
8	GB-AD-300-T	All-purpose test sample mount adapter plate
9	B2S-75-SAP300	Aperture plate stray light blocker
10	B2S-75-C-70-200	Carrier
11	PMS-S25-14	Post holder
12	PMS-14-95	Post
13	´PMS-DM45	Detector mount
14	PMSA-DM45-100	Aperture adapter

The lighting industry is currently in a state of flux attempting to replace traditional light sources with physical and organic Light Emitting Diodes due to energy and environmental concerns. As a result long standing design standards and regulations based on halogen bulb lamps, discharge lamps and others are not longer valid. This is because of the LEDs geometrical emission characteristics which requires more flat-field lens designs than traditional reflectors. The single filament or arc found in traditional lamps are being replaced by diode array matrix set-ups that act more as area sources than as spot or point sources. Light source design engineers therefore need spatial emission data of the LED itself, from LED matrixes and the finished light source product. Because of the enormous variety and number of LEDs available and the rapid technology improvements the need for compact size and easy to handle goniophotometers is increasing as well. Gigahertz-Optik's modular concept of light meters and accessories, e.g. mechanics and stages, enables individually designed goniophotometer systems based on customer requirements and budget.

The length of the goniometer bench depends on the maximum size of the light source. For single element LEDs the measurement distance between source and detector can be short (100mm). For LED matrixes and large light source fixtures a longer bench is required. If the goniometer is assembled to a linear motion carrier distances can varied and easily set. The optical axis of the GB-GD-360 two axis goniometer is 360mm above the bench. Combined with the all-purpose GB-AD-300-T adapter plate test samples with a maximum depth of 100mm and a maximum weight of 1kg can be handled. The test sample positioning with respect to the goniometric reference point is supported by the alignment tool. The detector stand is fixed at one end of the bench. The detector mount for 45mm diameter detectors offers exchangeable aperture adapters. The goniometer bench can be combined with Gigahertz-Optik's lightmeters and light analyzers. Software DLL with operational GUI are offered as well as complete spatial luminous distribution measurement supporting software.

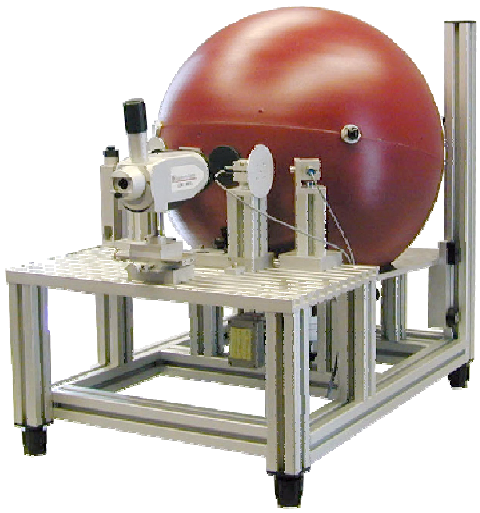
Application Example GB-ISS-500-OSO

Goniometric Object Surface Impression Observer Device

Object color definition describes the color without influence of surface structure and gloss. This means a test device with several surface segments with different degrees of roughness should effect the same observed color impression for each segment. Unidirectional test sample illumination would effect shadows and gloss and is therefore not useful for object color observation. Uniform hemispherical object illumination erases surface effects and simulates diffuse daylight illumination. This creates a daylight illuminated object impression to an observer. Three dimensional objects observation can be supported by a goniometer offering the possibility of different viewing angles. These kinds of application set-ups require an integrating sphere light source where the object on the goniometer is located in the center of the integrating sphere to ensure uniform illumination independent of the sample orientation. Daylight object color observation require D65 illumination and controllable illuminance levels ideally up to 100000lx and more. For this type of measurement Gigahertz-Optik combines the GB-IS-500 integrating sphere goniometer and a lighthouse type light source with PMS-TSZ-R Z-axis stage which offers remote control intensity control by moving the source in and out of the sphere. A reference lightmeter for illuminance and color temperature (HCT-99D) displays the set values. The complete observer device is set-up into an aluminum frame with wheels.

Application Example GB-ISS-500-LCM

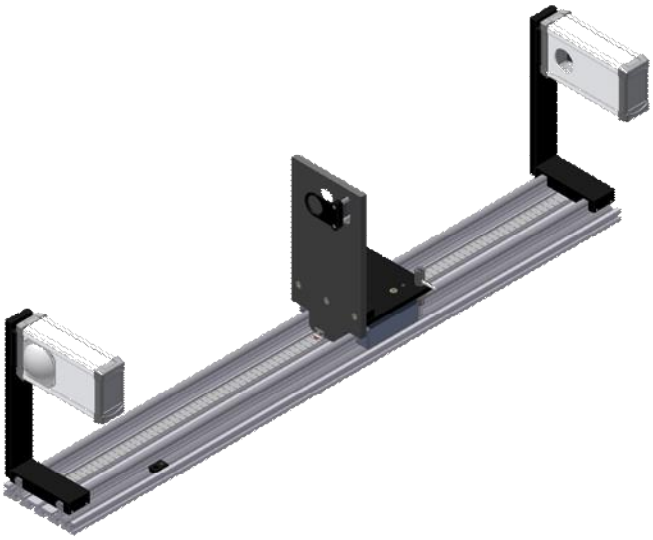
Goniometric Luminance and Color Contrast Measurement Device



TFT and other displays have a viewing angle and ambient light dependent impression of color and visibility. Diffuse illumination of such kind of displays will reduce the contrast in color and visibility. To qualify displays in research and quality control, uniform hemispherical display illumination is required. The contrast is evaluated by luminance measurements at different display luminance intensities during constant display illumination conditions. To measure the spatial luminance distribution the display must set on a goniometer drive. The uniform hemispherical illumination (independent of the display orientation to the luminance measurement device) is supported by the integrating sphere light source with the display located in the sphere center. Gigahertz-Optik's X4 light analyzer is the right luminance and color-measurement device for this job. The color temperature of the display illumination is not important since the illumination conditions can be measured and if needed simulated to other conditions. For the GB-ISS-500-LCM set-up Gigahertz-Optik combines the GB-IS-500 integrating sphere goniometer with a tungsten halogen lamp light source. The complete measurement device is set-up into an aluminum frame with wheels.

Application Example B2S-75-TRTH

Regular, Diffuse and Real In-line Transmittance Measurements



B2S-75-TRTH with LCRT-2005-S Source and Receiver

D/0 Set-up

0/0 Set-up

Gigahertz-Optik's LCRT-2005-S is an all-purpose portable spectral photometer for light transmittance measurement applications. It provides a hand-held tool useful for transmittance measure of large size objects, e.g. automotive, airplane, solar cell windows. This unique device supports other measurement applications as well like the measurement of light transmittance under different sample illumination conditions. This is done by positioning of the test sample at different distances to the LCRT-2005-S diffuse light source. Short distances simulate D/0 (total transmittance), long distances 0/0 (regular or in-line transmittance) measurement geometries. A unique feature of the LCRT-2005-S with its bench is the ability of linear adjustment between D/0 and 0/0 illumination conditions allowing the user to find the illumination geometry for best contrast in his application. At very long distances the measurement conditions for real in-line transmittance can be simulated. The bench is built with a one meter long B2S-75 bench, two carriers with mounts for LCRT-2005-S source and receiver and B2S-75-LMC85 linear motion carrier with sample holder. Small size samples up to 50mm wide can be fixed using the Slide&Fix clamp. Larger samples can be measured by removing the post of the Slide&Fix clamp. More information is available in the LCRT-2005-S datasheet.

Application Example PMS-RIT

Real In-line Transmittance Measurements

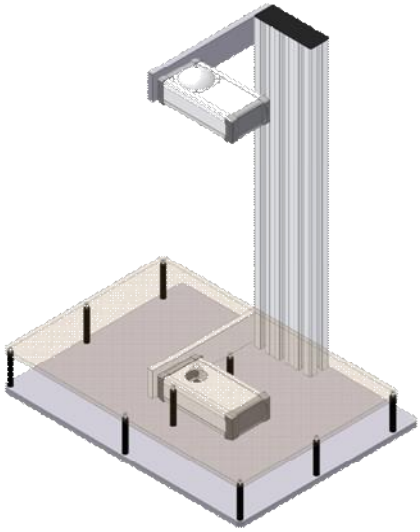
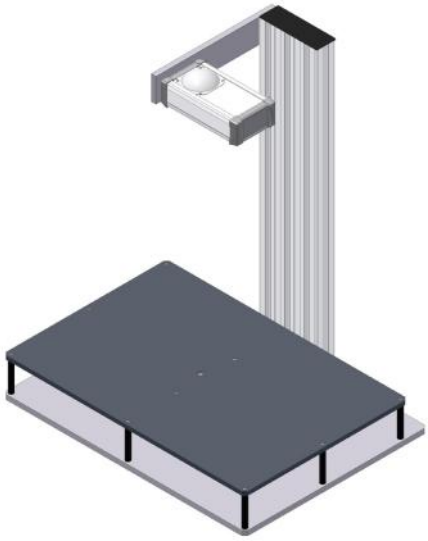


Illustration with Transparent Table



PMS-RIT Option for LCRT-2005-S

In applications where only the 0/0 transmittance measurement geometry is of interest Gigahertz-Optik offers an alternative to the B2S-75-TRTH bench. The PMS-RIT is set up with a long source to sample distance. The large table in front of the LCRT-2005-S receiver supports simple handling of the test sample in the measurement beam. In this set-up the measurement geometry is very close to that of the LCRT-2006 which is in use at ceramic institutes involved in R&D of transparent ceramic. More information is available in the LCRT-2005-S datasheet.

Gigahertz-Optik GmbH is a world class manufacturer of innovative UV-VIS-NIR optical radiation measurement instrumentation for specification critical industrial, medical and research application. Light gauges for transmission, reflection and fluorescence support material testing in service and production. Calibration standards supports customers on-site comparison of light detection and imaging sensors. Traceable calibrations are the basic reference to ensure quality for all light measurement instruments and calibration standards. The Gigahertz-Optik calibration laboratory for optical radiation quantities provides the most extensive range of calibrations available from industrial suppliers. For the measurement *spectral responsivity* and *spectral irradiance* Gigahertz-Optik is accredited by the Deutscher Kalibrierdienst (DKD) as calibration laboratory according to ISO/IEC 17025 since 1993 with registration number DKD-K-10601.

Products and Services

Light and Luminous Color Meter
Light Analyzer for Lamp and LED Testing
Light Meter for Pulse Shape Analysis
Goniophotometer
UV-A, UV-B and UV-C Radiometer
UV Germicidal Light Meter
UV Hazard Light Meter
Light Transmission Spectrophotometers
Integrating Spheres for Light Measurements
Integrating Spheres for Reflection and Transmission Measurements
Integrating Sphere Measurement Systems
Integrating Sphere Light Sources
Optical Diffuse Material (OP.DI.MA.)
Barium Sulfate Paint
Catalogue Products
OEM and Custom Made Product Service
Calibration Standards
Calibration Laboratory for Optical Radiation Measurement Quantities
Calibration Laboratory for Spectral Reflectance
Calibration Laboratory for Spectral Transmittance
DIN EN ISO/IEC 17025 accredited Calibration Laboratory DKD-K-10601 since 1993

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