LabSpion

User Manual

Last edited August 25, 2017

VISO SYSTEMS

Content

Safety Information

Warning! This product is not for household use.

Read this manual before installing and operating the LabSpion, follow the safety warnings listed below, and study all the cautions in the manual.

Preventing electric shocks

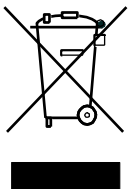
Make sure the power supply is always grounded.

Use a source of AC power that complies with the local building and electrical codes, that has both overload and ground-fault protection.

If the controller or the power supply are in any way damaged, defective, wet, or show signs of overheating, disconnect the power supply from the AC power and contact Viso Service for assistance.

Do not install or use the device outdoors. Do not spray with or immerse in water or any other liquid.

Do not remove any covers or attempt to repair the controller or the power supply. Refer any service to Viso.



Disposing of this product

Viso products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable.

Help preserve the environment! Ensure that this product is recycled at the end of its lifetime. Your supplier can give details of local arrangements for the disposal of Viso products.

Introduction

About this document

These guidelines describe the installation process of the LabSpion controller followed by the typical measurements of various light sources.

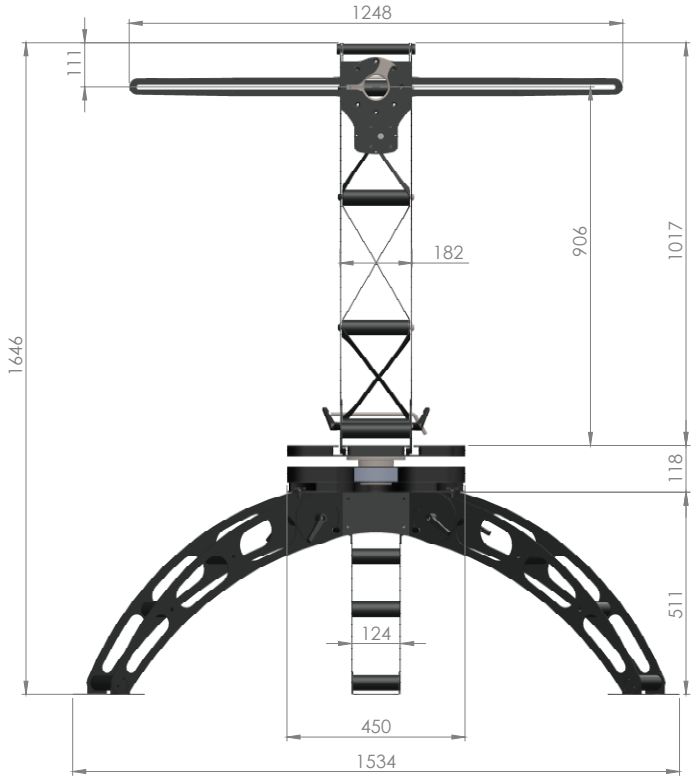
About the LabSpion

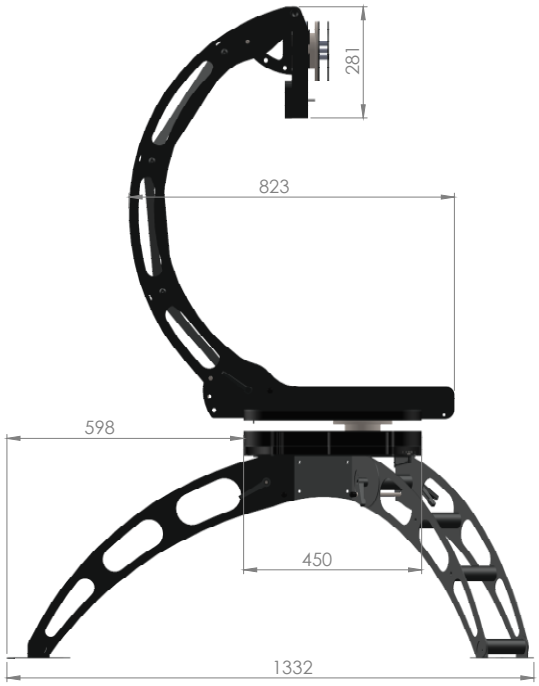
The LabSpion is a revolutionary new far field goniometer system with a spectrometer sensor that makes it possible to measure all photometric measurements quickly and efficiently. The Light Inspector software enables to quickly measure, save and export the newly obtained data.

Dimensions

Goniometer

The minimum distance between the LabSpion goniometer and the back wall is 1 meter. The minimum distance between the sensor and the end wall is 0.5 meters.





Packaging and weight

LabSpion item list

- Base
- Tower
- Stand
- C-plane head
- Lamp Bracket
- E27 Lamp holder
- Tripod
- Sensor
- Cali T50
- Bosch Cross Line Laser

Documents

- Assembly Manual
- Sensor Calibration Certificate

Cali T50 certificate

Base: 27 kg

Tower + C-Plane Head: 25 kg

Sensor + Cali T50: 6kg

Stand: 24kg

Tripod + Lamp Bracket + E27 Holder

Assembly Box

- 2 m IEC power cord
- 5 m USB cable
- 3 m RJ45 for connection between LabSpion Base and C-Plane Gonio Head
- 25m RJ45 cat 5 for connection between LabSpion Base and LabSensor
- Light Inspector USB stick (Windows)
- Bulb adaptor: E27, E14, G10, B22.
- Laser Distance Plate
- 1 x Steel Pin 200mm
- 2 x Steel Pin 45 degree handle
- 6 x Plastic end caps for pins
- 2 x Small Lamp Brackets + M10 Handles + 20mm Plastic Spacer
- 2 x M8 Handle + Thumb Screw for Base attach
- 8 x M6x35mm Screws for Lamp Bracket mounting
- 8 x 20mm plastic spacers for Lamp Bracket Mount
- 2 x M6 Thumb Screws for Laser Distance Plate

Shipping Packages

	Shipping packages	Shipping dimensions	Weight
1.	Sensor + Cali	50 x 51 x 32 cm	6 Kg
2.	Base	56 x 56 x 34 cm	27 Kg
3.	Bracket + Tripod + Assembly Parts	128 x 26 x 26 cm	8 Kg
4.	Tower + C-plane Gonio	46 x 33 x 119 cm	25 Kg
5.	Stand	59 x 59 x 102 cm	24 Kg

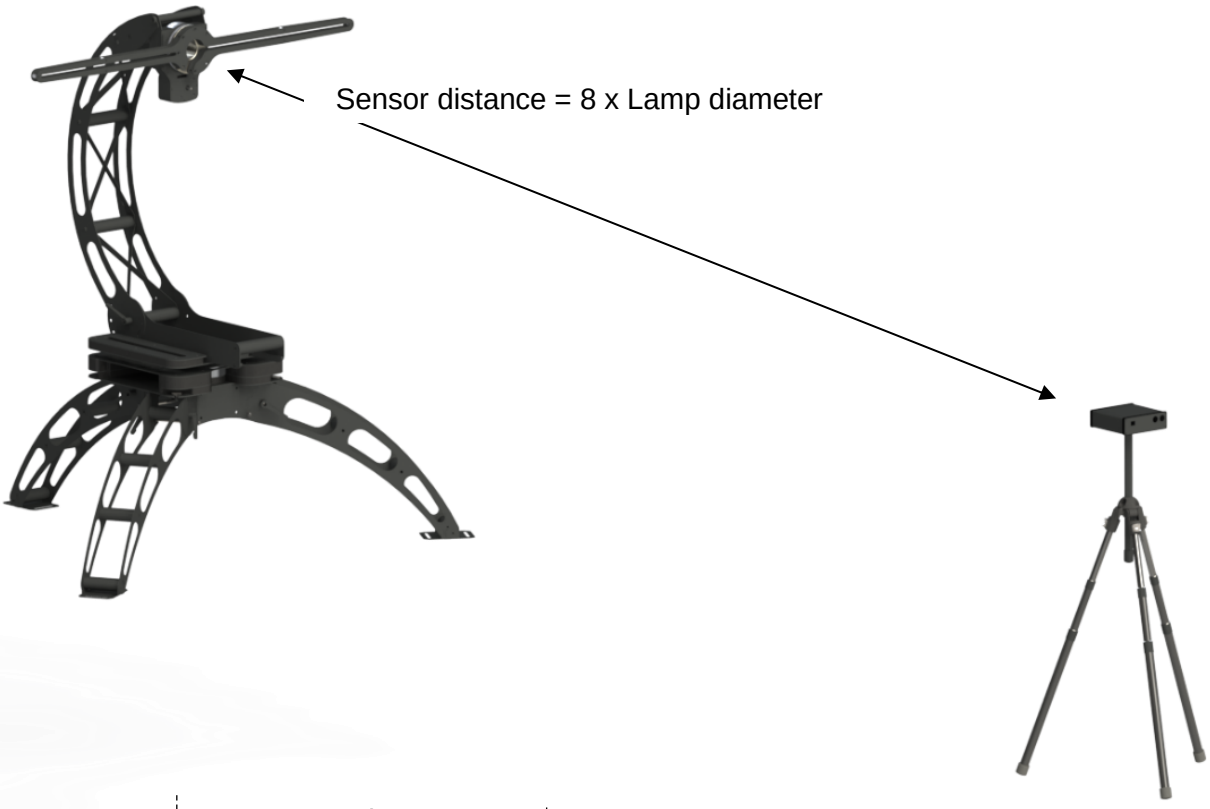
Total shipping weight: 90 kg.

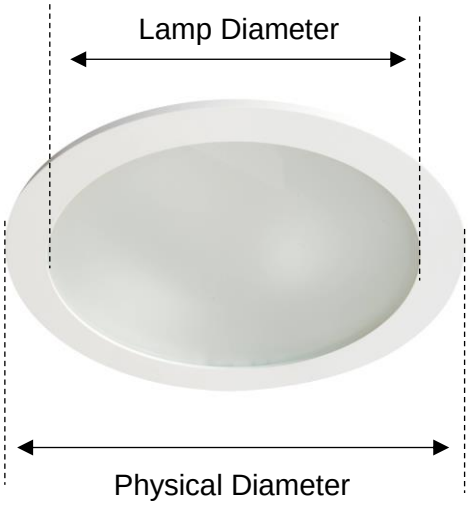
The shipment is done in a total of 5 packages.

Room considerations

Sensor distance

The measurement method used in the LabSpion system is called far field, which means the distance between the measuring light source and the sensor should be at least 8x the diameter of the lamp as shown below.



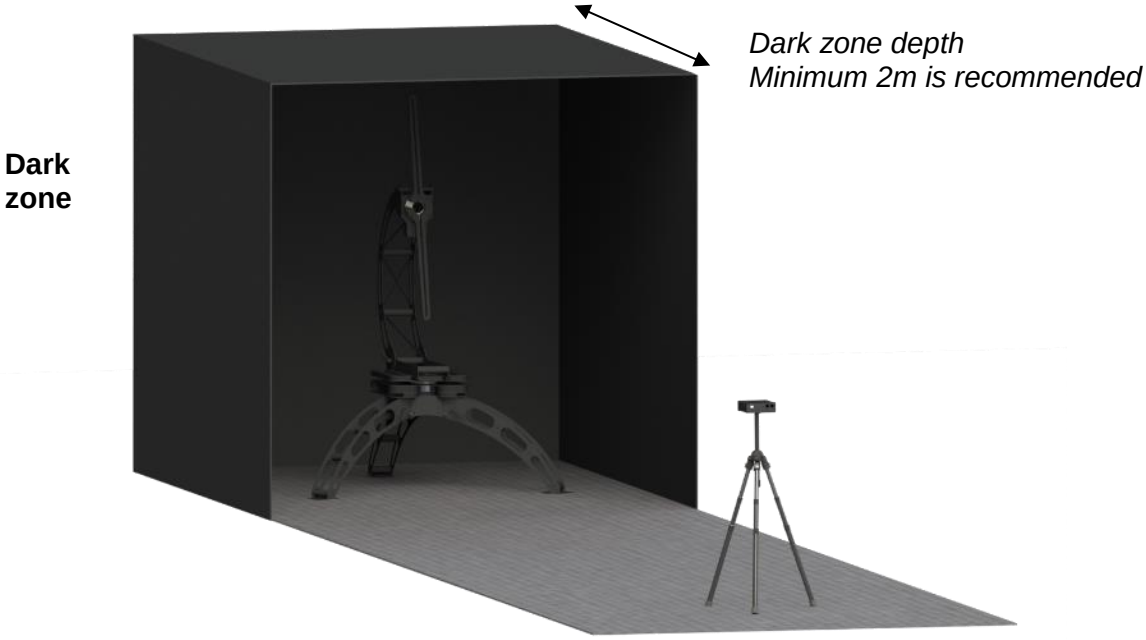


Note !! The “Lamp diameter” is only the illuminating part of the lamp.

Lamp diameter	Minimum sensor distance
0,25 m	2 m
0,50 m	4 m
1,00 m	8 m
1,50 m	12 m

Goniometer Dark zone

Normally when doing light measurement, a completely dark room is needed. But with the LabSpion it is not a necessity for the whole room to be dark, as the sensor uses a special directional sensor. This means having only the goniometer zone dark will be sufficient, as shown below.



The Dark Zone is recommended to be 2 meters or more.

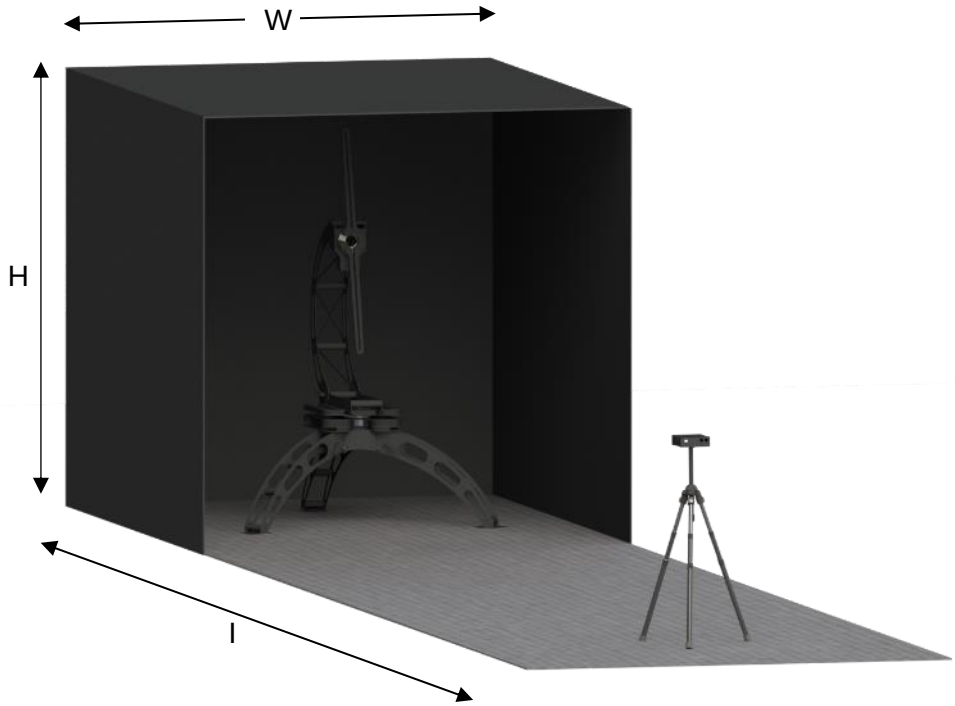
A room can be darkened either by painting the walls black or using a black curtain.

A black molton curtain can be better than a painted wall, as the folds in the curtain works as small light bafflers trapping the light.

Note *If you have the option to have a fully dark room, this should this should be your first choice.*

Minimum room dimensions

As the distance to the sensor must be at least 8 x lamp diameter plus the physical properties of the goniometer (1 m) and the sensor (0,5 m) we can calculate the minimum dimensions of the room to be as shown below



Recommended minimum room size

Lamp diamter	W = Room width	H = Room height	I = Room length
0,25 m	1,7 m	2,2 m	3,5 m
0,50 m	1,7 m	2,2 m	5,5 m
1,00 m	1,7 m	2,3 m	9,5 m
1,50 m	2,0 m	2,4 m	13,5 m

Measuring through a door opening

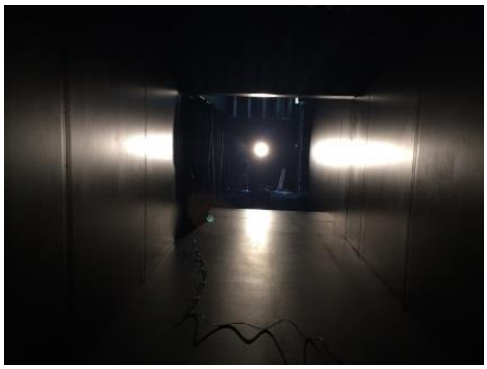
In cases where the length of the room is not sufficient for larger fixtures, the sensor can be placed outside a door opening to extend the sensor-to-light source distance as shown below

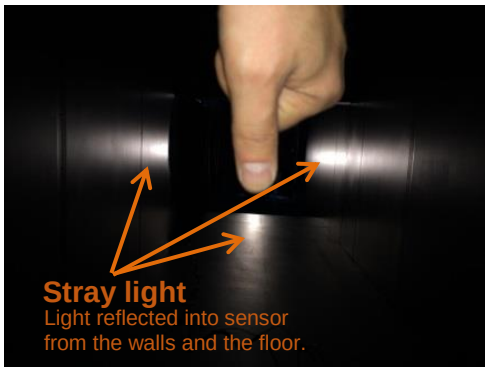
Placing the sensor outside of the room using a door opening does not adversely affect the measurement. In fact, the doorway opening can help reduce stray light.

It should be noted that if the outside room is not dark, the “calibrate to ambient” functionality must be used to deduct the ambient light from the measurement.

Narrow room considerations

Even a dark wall or floor can reflect light also known as stray light, resulting in too high measurement values. When the sensor is close to the walls or floor the stray light can enter the sensor and give higher measurement result.

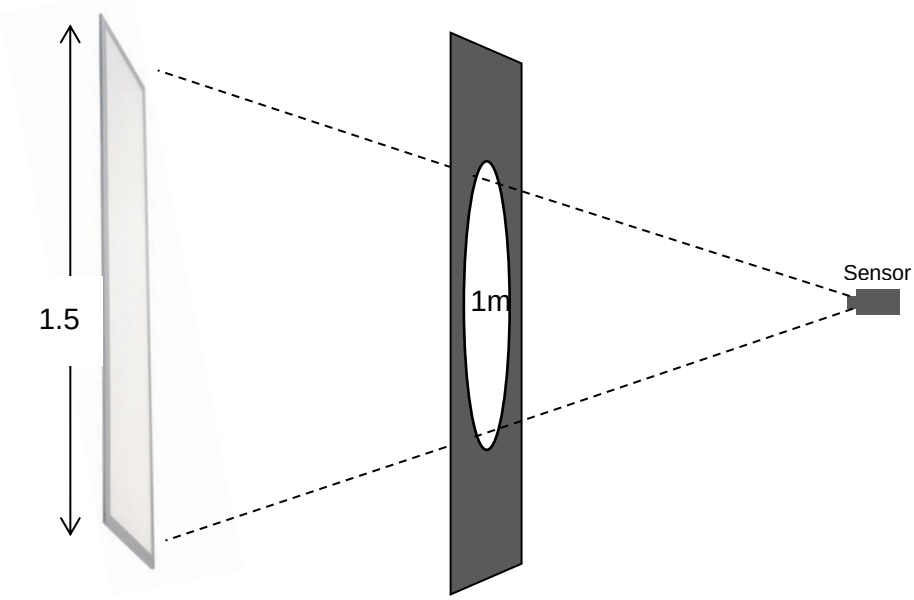




A stray light check can easily be done by standing at the sensor position and block the light from the senor with your finger and checking if any other light is visible.

Light baffle

One of the simplest solutions to eliminate stray light is to place a port hole (light baffle) as illustrated below. A light baffle will remove the



Creating a Light Baffle

Creating a light baffle can be done by using a black curtain and make a circular whole in the middle, as shown below. Place the light baffle between the goniometer and sensor at a distance where the lamp is visible from the sensor.

The LabSpion can measure fixtures up to 150 cm lamps, so the size of the light beam half way from the sensor to the lamp will be 75 cm. So a light baffle placed in this case needs to have a diameter of 100cm to compensate for small errors in installation.

The practise of cutting out a light baffle, along with the final results, is shown below.

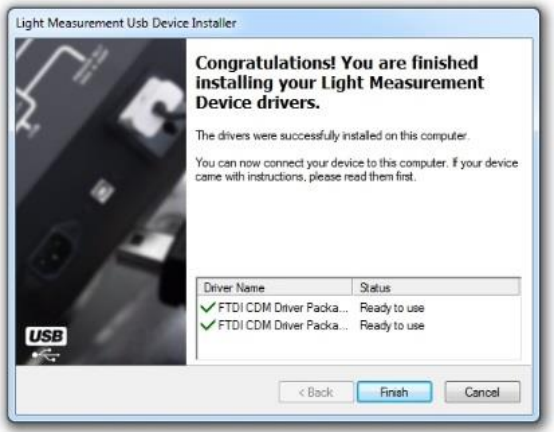
Installation

Software installation

Be Before you can start using the LabSpion, the “Viso Light Inspector” software must be installed. It is supported on all windows platforms.

Use the following link to download the latest version:

http://www.visosystems.com/download-light-inspector/

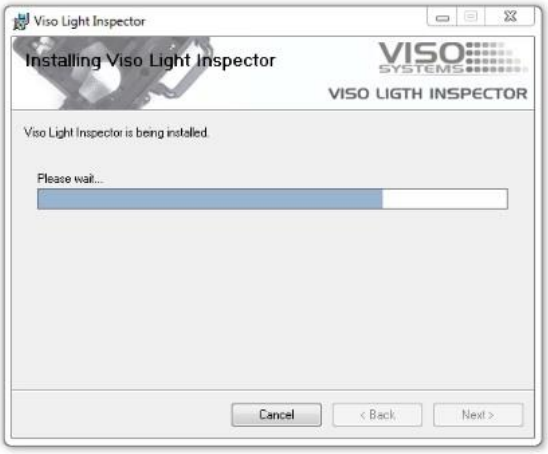


1) Please make sure the LabSpion is not connected to the computer during software installation.

2) Run the .msi file and follow the installation instruction.

3) USB drivers are automatically installed.

Your measurements are not lost when updating to a newer version or uninstalling and reinstalling. All measurements will always remain in your document folder. If you want to remove all your measurements go to the ‘Light Inspector’ folder and delete them manually.



Folder location:

C:\Users\’Username’\Documents\Viso Systems\Light Inspector

Or if stored in dropbox:

C:\Users\’username’\Dropbox

Connect power

The LabSpion comes with a standard IEC power-in connector and with a standard euro power cable, but any power cable can be used as the Labspion supports any outlet voltage from 90-260VAC.

The power-in connector supplies power to the goniometer motor, power analyser and the light source being measured. Which means the power feed to the system is also what is being delivered to the light source to be measured.

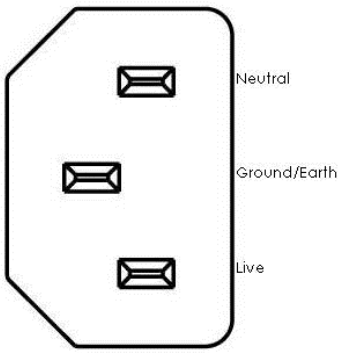
AC power supply cable plug

Warning: Risk of an electric shock! Plug installation shall be performed by a qualified electrician.

A grounding-type (earthed) power plug that fits the local power outlet must be used. You can acquire an IEC power cable with a suitable grounding-type plug from most of consumer electronics stores.

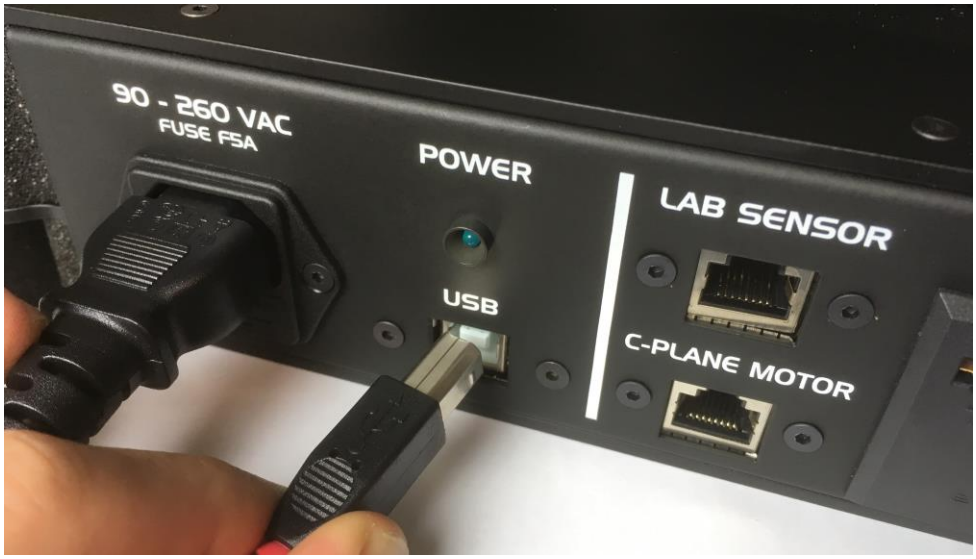
When installing the plug connect pins as follows:

- **Yellow and green wire to grounding (earth)**
- **Blue wire to neutral**
- **Brown wire to live**



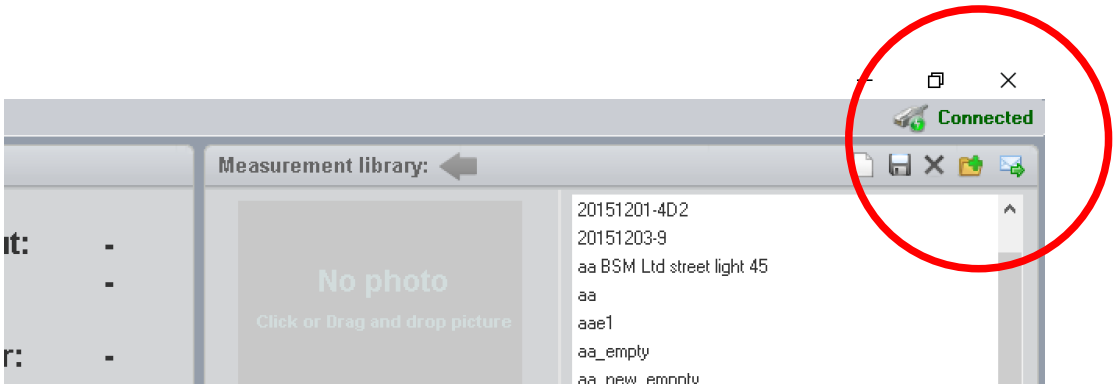
Connect USB

The LabSpion is connected to the computer using a USB connector type A to B. 5m USB cable is included with the LabSpion, however any USB cable supporting USB2.0 can be used.



The USB provides communication and power to the LabSpion' main board processor. But to run power analyser and photo spectrometer, you need to have power connected.

Start the "Viso Light Inspector" software after having connected the USB; the connection to the Labspion will be established automatically. A successful connection is shown with a green "Connected" icon in the upper right corner of the 'Viso Light Inspector' software.



You can connect and disconnect the USB without restarting the "Viso Light Inspector" software, as the connection is always established automatically as soon as the USB connector is plugged in and vice versa.

Connecting the LabSensor

The LabSpion is connected to the LabSensor with a RJ45 cable, which is supporting the transfer of data and power between the two parts.

Warning

Do not connect the LabSensor to the C-plane motor connector, this could damage the LabSensor.

Connecting the C-plane goniometer

The C-plane goniometer is connected to the LabSpion base through a RJ45 cable. The LabSpion will automatically detect the C-plane goniometer.

Warning

Do not connect the C-plane motor to the LabSensor connector, this could damage the LabSpion.

Connecting lamp power

The LabSpion has a built-in power analyser and power switch. The power switch is used when running in ambient light correction mode. So the lamp can be switched off before a measurement, so that the values of the ambient light can be obtained and subsequently subtracted from final measurements.

The maximum current supported by the lamp output is 3A, which is 660W at 220VAC and 330W at 110VAC.

AC power supply cable plug

Warning: Risk of electric shock! Plug installation shall be performed by a qualified electrician.

A grounding-type (earthed) power plug that fits the local power outlet must be used. You can acquire an IEC power cable with a suitable grounding-type plug from most of consumer electronics stores.

When installing the plug connect pins as follows:

- **Yellow and green wire to grounding (earth)**
- **Blue wire to neutral**
- **Brown wire to live**

Connecting diagram

Below there is the connection diagram showing the different connections in order to make the system operational.

Alignment of the sensor

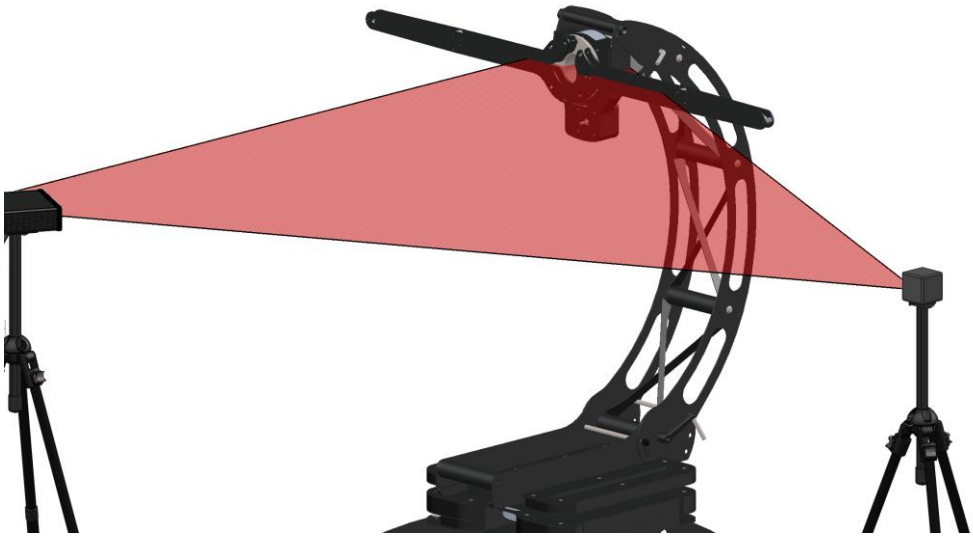
Before making any measurements it is important to place the sensor at an appropriate distance and to align it accordingly to the goniometer.

Height alignment

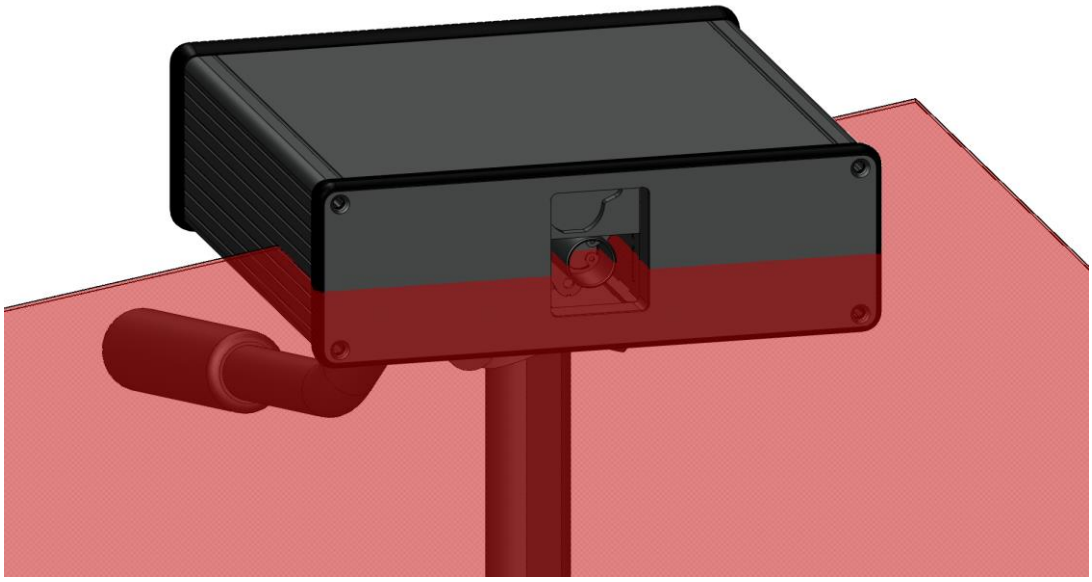
The sensor must be adjusted so the lense in the sensor is aligned to the center of the C-Plane Gonio.

To do this, place the sensor on a tripod or table beside and align the horizontal laser beam to the center of the C-Plane Gonio, see below

1) Make sure the horizontal laser beam is aligned with the center of rotation the C-Plane.



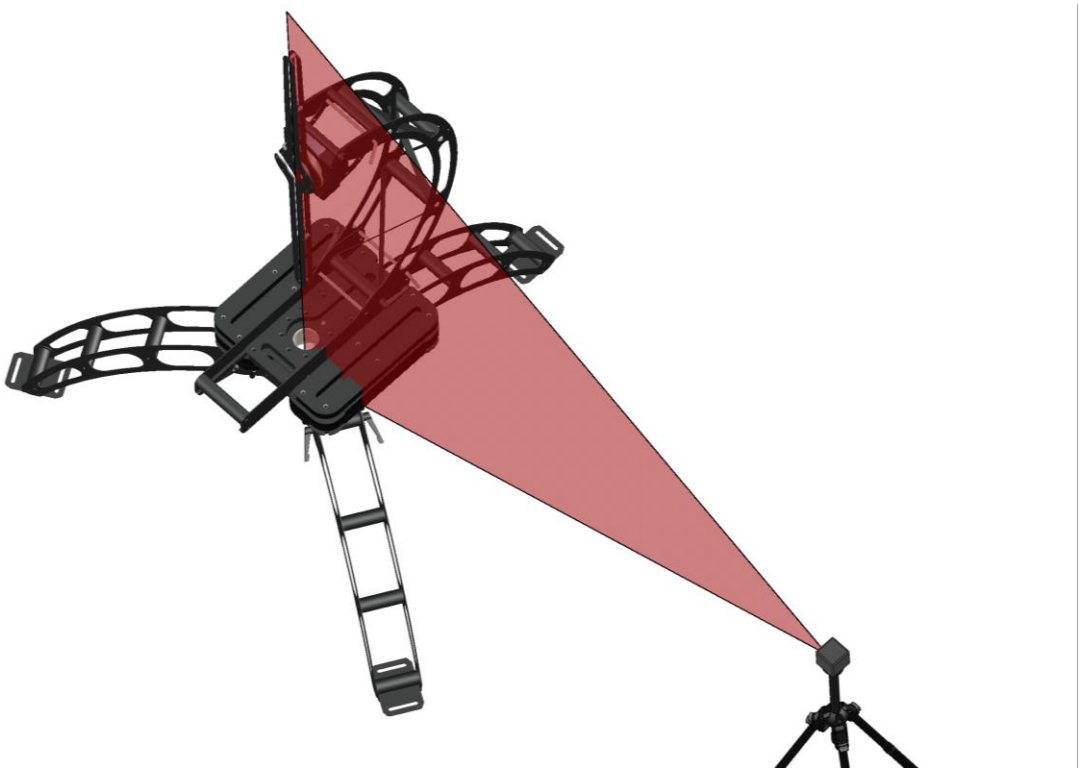
2) Adjust the height of the tripod so the laser beam hits in the center of the lense on the sensor.



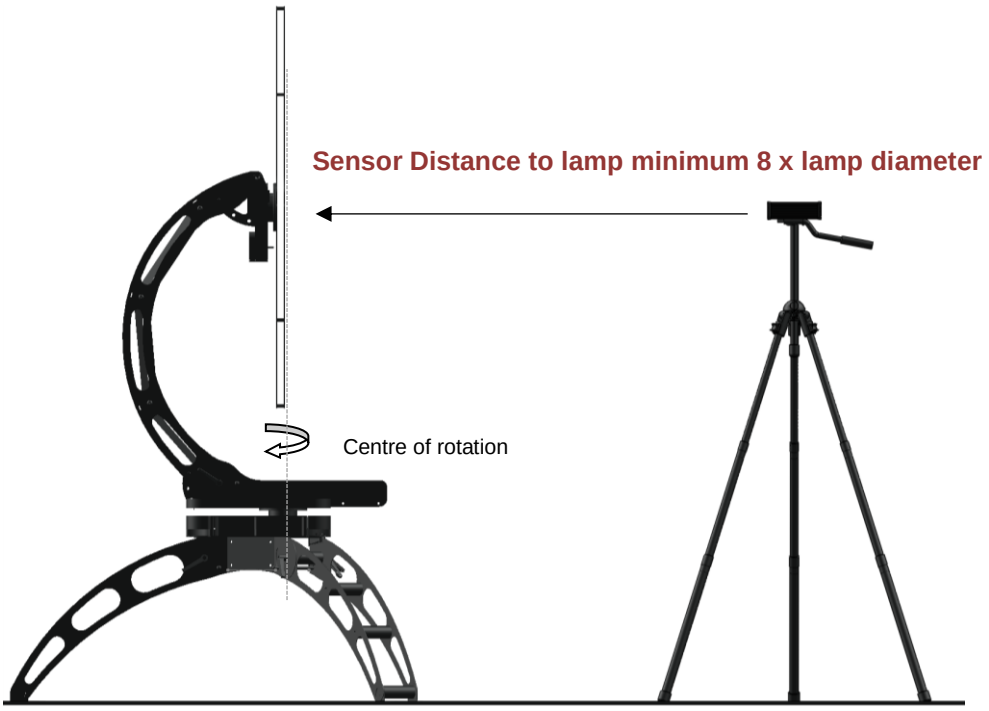
Set distance of the sensor

To set the correct distance, align the lamp bracket so the front is in center of rotation of the Base.

This can be done with the laser as shown below or simply move the Tower till you can see it is in center of rotation.



Then you are ready to measure the precise distance from the sensor. Press the ‘Measure Distance’ button on the back of the sensor and the distance will be automatically set in the software. A window will appear in the software showing the distance set, press ok or hit enter to this.

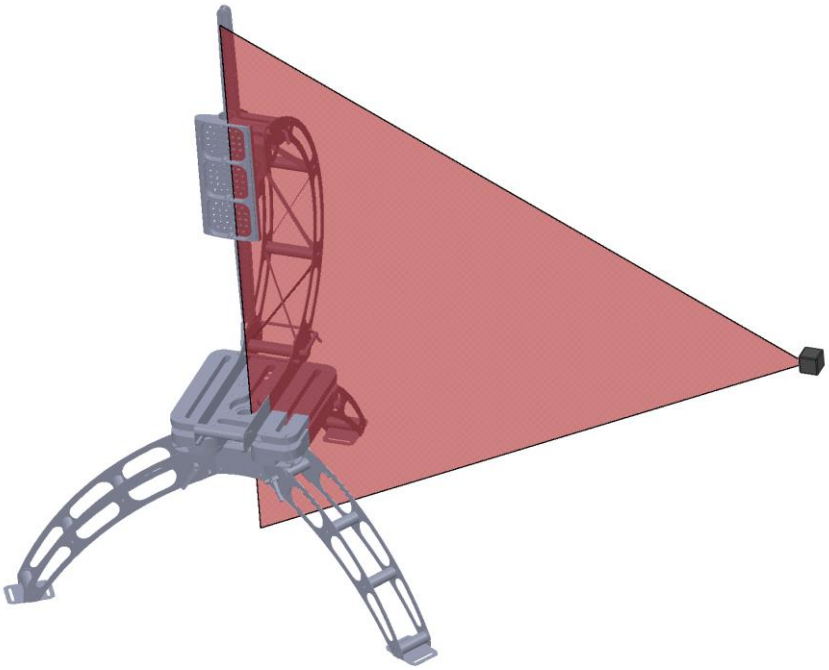


Mounting and Alignment of the lamp

Use of the Laser Level Tool

Aligning the lamp to be measured is key to ensure a precise measurement. Specific tools to align the lamp relative to the centre of rotation, namely centre alignment bracket and an aligning laser box, are included with the LabSpion system. First, place the centre alignment bracket in the middle of the rotating opening. It is designed in such a way that it will always sit in the middle of the opening.

Then place the laser box on the wall, table or a tripod next to the LabSpion and align the lamp to the centre bracket as shown in the pictures below.

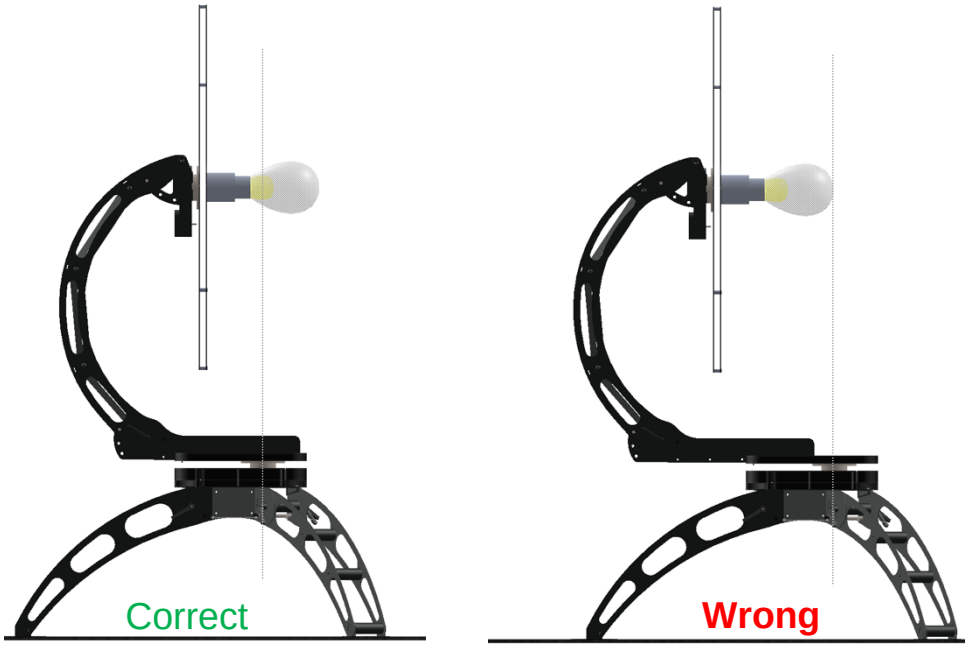


ATT!

The laser module inside the laser tool is hanging loosely so the laser beam is in level although the tool is placed on an off level surface or wall.

Adjust lamp to laser

The laser box will shoot two perpendicular beams which form a crosshair, but its only the vertical beam that is used for this alignment. When the vertical beam hit the center bracket, the center of the lamp can aligned to this

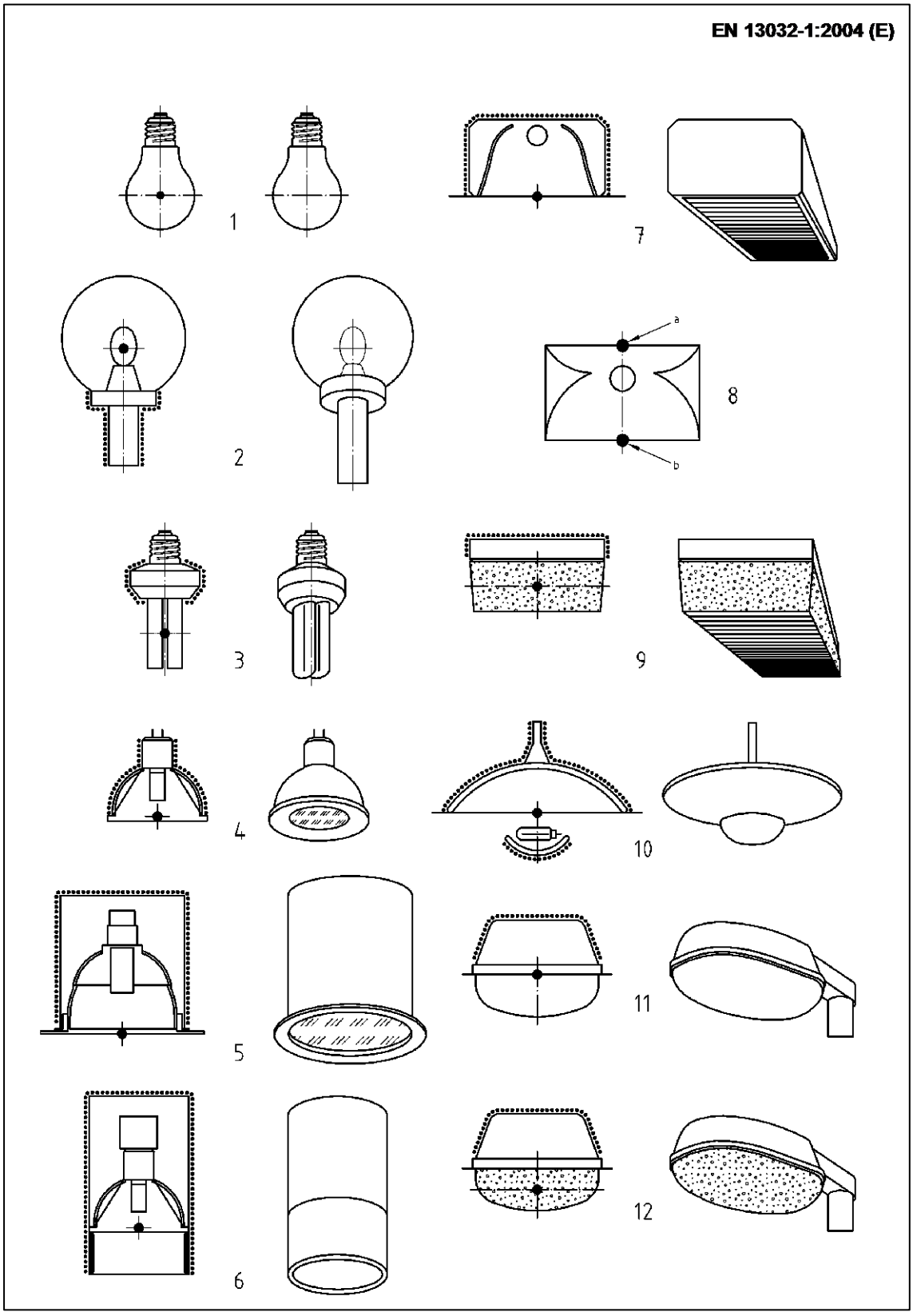


The EU standard (EN 13032-1:2004) states that luminaires with transparent sides or without closed sides should be centered at the lamps photometric centre. See photo above.

Luminaires other than those above have the definition of their photometric center given in the publication on the next two pages.

Center of luminares

The black spot marks the photometric center of the different lamps. This photometric center is what should be aligned with center of rotation of the Base.



Explanation of presentation

Presentation	Explanation
●	Photometric centre
▬▬▬▬	opaque, substantially black
/// /// ///	opaque, diffuse or specular reflectant
⁘⁘⁘⁘	translucent, clear
.....	compartment

Photometric centre of light sources

1) Incandescent lamp
2) With a clear cover
3) Compact fluorescent lamp
4) Reflector lamp
5) Luminaire with reflecting mirror
6) Luminaire with shield, substantially black
7) Luminaire with opaque sides
8) Direct-indirect luminaire
   a) Luminant area 1 with photometric centre 1
   b) Luminant area 2 with photometric centre 2
9) Luminaire with diffusing/prismatic sides
10) Indirect luminaire with secondary reflector
11) Outdoor luminaire with clear cover
12) Outdoor luminaire with diffusing/prismatic cover

Mounting of fixtures with a static base

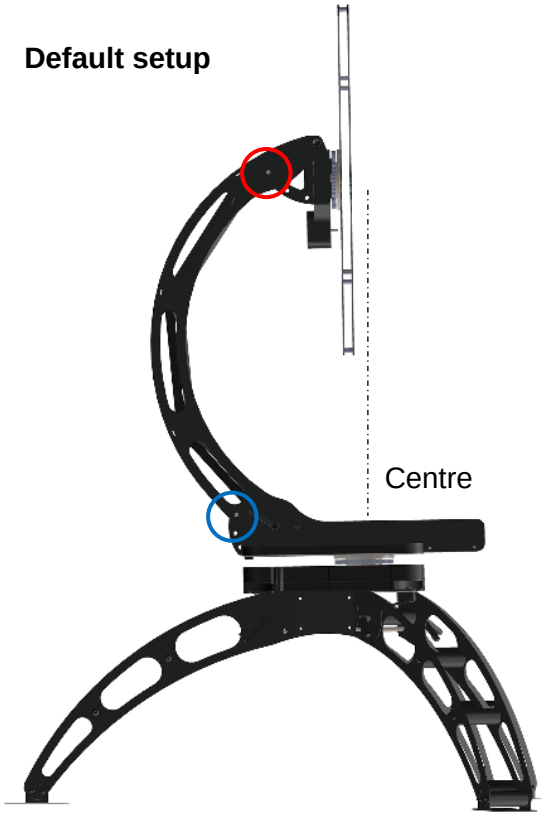
It is convenient to keep the base of the LabSpion still when mounting various light sources for measurement. Therefor the the system comes with a magnetic lock which is located on the back of the LabSpion Base, as shown on pictures below:

When the lock is closed the Base is fixated and lamps can easily be mounted. If a measurement is started with the Base locked a warning will appear in the Light Inspector software, asking you to unlock the base before continuing (see pictures below).

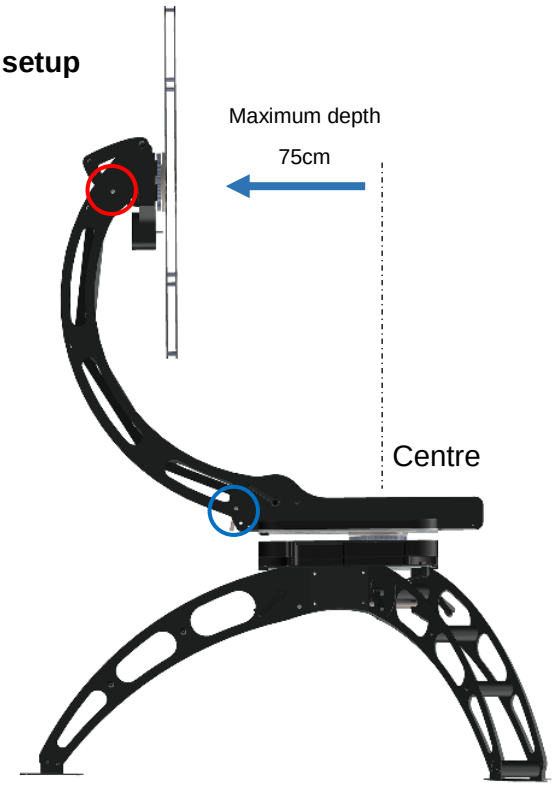
Adjustment of the lamp holder arm

In situations when a lamp with a big depth needs to be measured, for instance a high bay lamp, the large horizontal dimensions of the lamp will make it impossible to align it with the centre of rotation. There for the default geometry of the LabSpion has to be modified. Consider the following two pictures:

Default setup



Extended setup

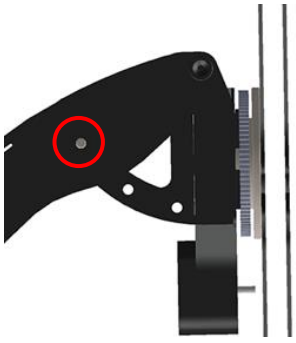


The figure to the left is the default configuration of the LabSpion and the right drawing shows the modified version of the LabSpions geometry. The arm with the Tower tilted backwards leaving more room for horizontally expansive lighting fixtures.

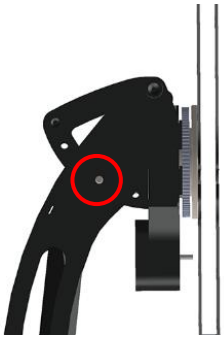
To tilt the Tower backwards:

1) Loosen the two big handles on each side of the Tower, move the pin (see blue circle) to the next position and then tighten the two handles again.
2) Move the pin that is holding the head to the next position.

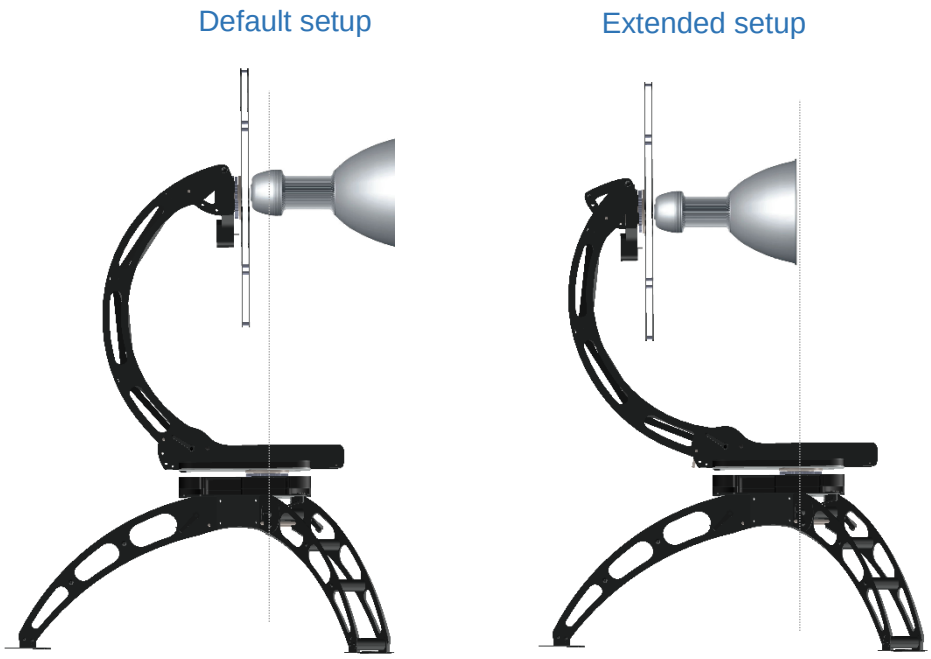
Default setting



Adjusted setting

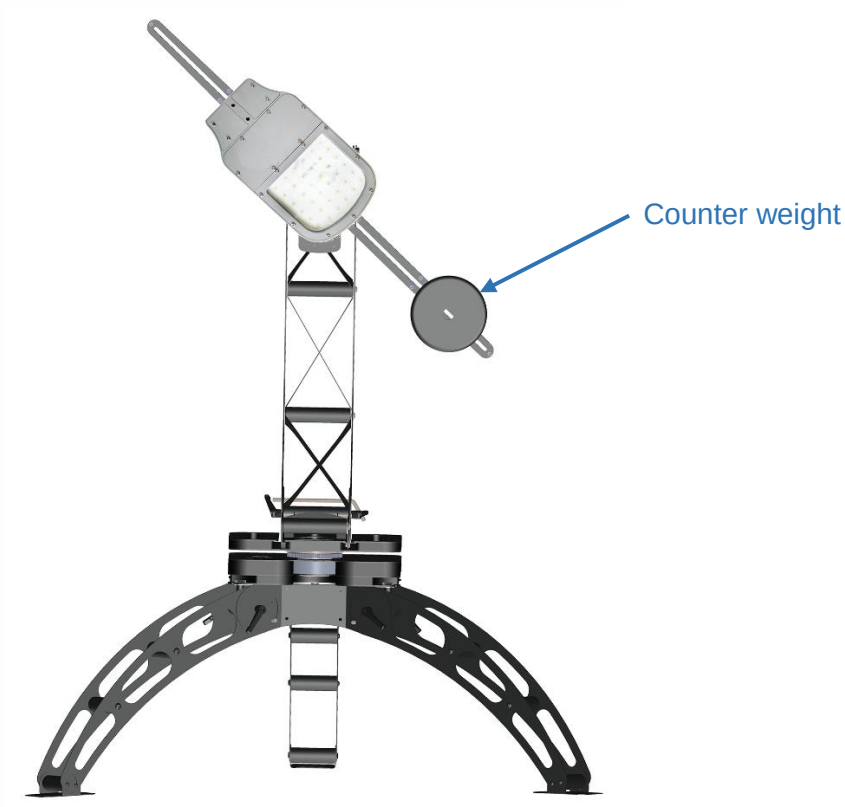


Example of a high bay lamp placement is presented below:



Mount lamps with counter weight

In some lamps the weight is unevenly distributed, such as a street light fixture. The centre mass point of such a lamp is not coinciding with the central alignment of the LabSpion. To balance the central position of such a lighting fixture, a counter weight must be used. See the picture below.



Making measurements

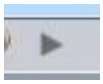
Alignment of the sensor

Before making any measurements it is important to place the sensor at an appropriate distance. The LabSpion is a far field goniometer system, which means that the distance between the sensor and the lamp should be equal to or larger than eight times the lamp length/diameter.

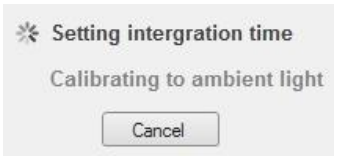
Further info, see *Installation Chart page 10*

Making a measurement

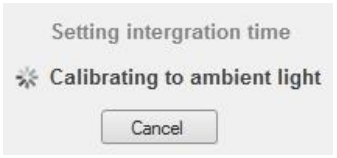
1) A measurement is simply started by clicking on the play icon on the menu bar.



2) Then the integration time is set automatically.



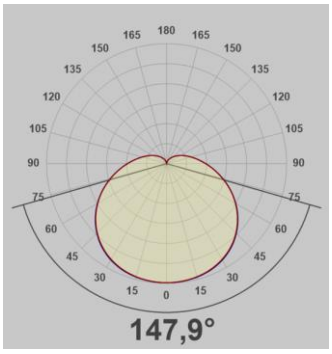
3) The ambient light level is automatically measured by turning off the light source.



4) The power is then measured and stored.

5) The light source is then rotated at 180 degrees to prepare for measurement.

6) The complete 360 degrees angular light field is then measured and the beam angle is calculated.



For an in depth walkthrough of the Light Inspector software, go to the **'Light Inspector Manual'**.

Specifications

Measurement method…… Far Field

Physical dimensions

Shipping dimensions (L x W x H)…….. (See shipping dimensions)

Shipping weight…… 90 Kg

Dimensions (L x W x H)…….. (See dimensions)

Weight…….. 78 Kg

Sensor distance range…… 0,5 - 50 m

Sensor distance…… >= lamp length x10 (minimum 8 x lamp diameter)

Sensor distance setup……..Laser range finder (build into sensor)

Lamp diameter range……0 – 1.5m at 2 axis (1 axis up to 6m)

Lamp maximum weight…… 25Kg

Electrical

Power supply input…… 90 - 260 VAC, 50/60 Hz

Power consumption…… 60W (Idle 15 W)

USB current consumption…… 300 mA

Power analyser voltage range…… 90VAC-260VAC <+/- 0.5V

Power analyser current range…….. 0 - 3A (Avg: +/- 0.5mA)

Power analyser power range @ 230V……... 0 - 600W (Avg: +/- 0.1W)

Power analyser power range @ 110V……... 0 - 300W (Avg: +/- 0.1W)

Power analyser sample rate……... 70.000 samples/sec

Photometric

Flux, lumen @ 0.5m……... 0,21 – 7.500 +/- 4%

Flux, lumen @ 5m…….. 21 – 750.000 +/- 4%

Flux, lumen @ 10m……... 84 – 3.000.000 +/- 4%

Flux, lumen @ 20m…….. 336 – 12.000.000 +/- 4%

Flux, lumen @ 40m…….. 1.344 – 48.000.000 +/- 4%

Intensity, candela @ 0,5m…….. 0,07 – 2.500 <+/- 4%

Intensity, candela @ 5m……... 7 – 250.000 <+/- 4%

Intensity, candela @ 10m…… 28 – 1.000.000 <+/- 4%

Intensity, candela @ 20m…… 112 – 4.000.000 <+/- 4%

Intensity, candela @ 40m…….. 448 – 16.000.000 <+/- 4%

Colour temperature……. 1.000K-40.000K < avg +/- 35K

Colour rendering index……. 0-100 <+/- 0,7

Angular resolution BASIC MODE…….5 degree step

(About 20 sec measurement time per C-plane)

Angular resolution HIGH MODE……...1 degree step

(About 1 min measurement time per C-plane)

Angular resolution highest resolution…….. 0,1 degree step

(About 5 min measurement time per C-plane)

Spectrometer……. Ibsen Photonics FREEDOM

Custom viso (high sensitive transmission grating)

Spectrometer range……... 360-830nm (1024 pixels)

Spectrometer detector……. SONY ILX511B

Calibration…….. Fully calibrated

Re-calibration……. Every 1 year

(Maximum 2 years)

Control and interface

Control interface…….. USB 2.0

Control connector……... USB-B

Connections

AC power in (power supply)……. IEC 3-pin

AC power out lamp……. Universal socket

Light source adaptor……. E27, E14, B22, GU10

PC…….. USB A

Approvals

Power supply…….. cUL/UL, CE, CCC, TUV, FCC

Power analyzer - LabSensor…..…… CE

Warranty

Warranty period……. 2 years

Ordering information

LabSpion…….. P/N LABSP001