

VISO SYSTEMS CALI-T50 Reference Lamp

User Manual

Revision: 2020-03



Congratulations on purchasing your new Viso Systems product. Before using this product, please read the Safety Information.

This manual contains descriptions and troubleshooting necessary to install and operate your new Viso Systems product. Please review this manual thoroughly to ensure proper installation and operation.

For news, Q&A and support at Viso Systems, visit our website at www.visosystems.com

Other manuals in this series (the latest version can be downloaded from www.visosystem.com):

- LabSpion Assembly Manual
 - LabSpion User Manual
 - BaseSpion Assembly Manual
 - BaseSpion User Manual
 - LightSpion User Manual
 - LightSpion Extender User Manual
 - LabFlicker User Manual
 - Light Inspector (software) Manual
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Introduction

About this document

These guidelines describe how to use the CALI-T50 as a reference light source and how to do custom calibrations on Viso Systems goniometer products.

Safety information



Warning! This product is not for household use.

Read this manual before installing and operating the CALI-T50, 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.

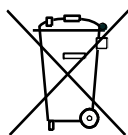
Use a source of AC power that complies with the local building and electrical codes, that has both overload and ground-fault protection.

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.

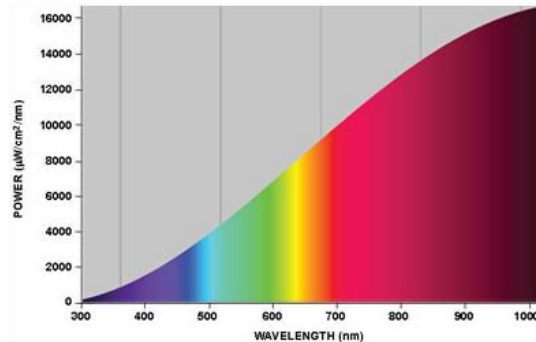
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About Calibration and Light Sources


All Viso systems are delivered pre-calibrated but it is possible to make a custom calibration of the photo spectrometer if desired. This could be necessary if the system is to be certified by an official agency, which will perform its own calibration and afterwards issue certification documents.

To make custom calibrations a calibration source must be used, and the spectrum and the intensity in a point at a certain distance must be known. Such a spectrum is usually specified as power in $\mu\text{W}/\text{cm}^2/\text{nm}$ as shown below.



Calibration sources can be obtained from a number of suppliers. This manual describes calibration procedures for the CALI-T50 from Viso Systems which is a tungsten irradiance lamp. The spectrum of the calibration source is usually provided in a .Imp file (lamp file).

All CALI-T50 light sources are traceable to Viso's calibration lamp (a Newport irradiance lamp with serial SN7-2011 with reference to NIST lamp F-602):

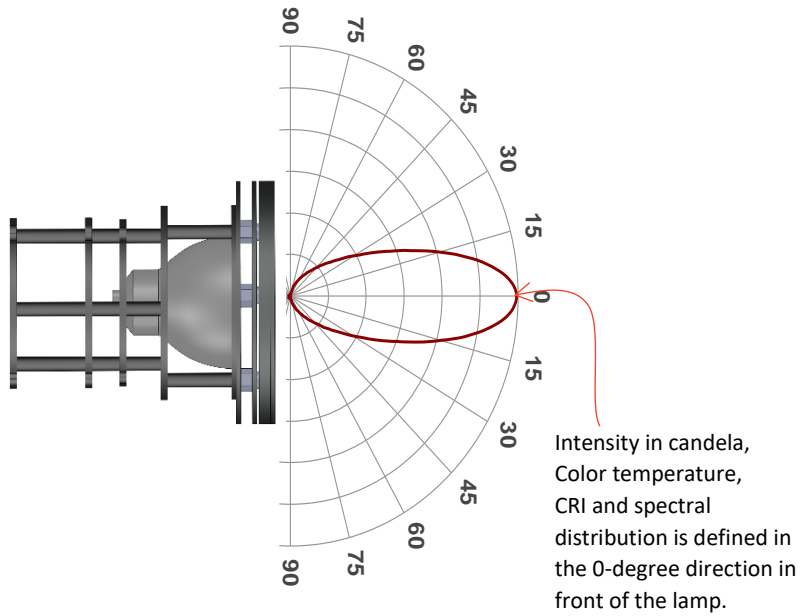
 <p>DRIEL INSTRUMENTS A Newport Corporation Brand</p>	Irvine, CA 92606 USA Tel: 1-877-835-9620
	<p><u>Certificate of Calibration</u></p>
Description: Spectral Irradiance (250 - 2400 nm) calibrated 1000 Watt QTH Lamp	
Certificate No.: 2014	
Model Number : 63350	Lamp Serial Number: 7~2011
Calibration Date : 2_2_17	Customer: Initial Purchaser
Environmental Conditions: Temperature: 24 +/- 1C	Relative Humidity (%): 50 +/- 5%

Important:

Calibrations must be made in a dark environment with non-reflective surfaces.

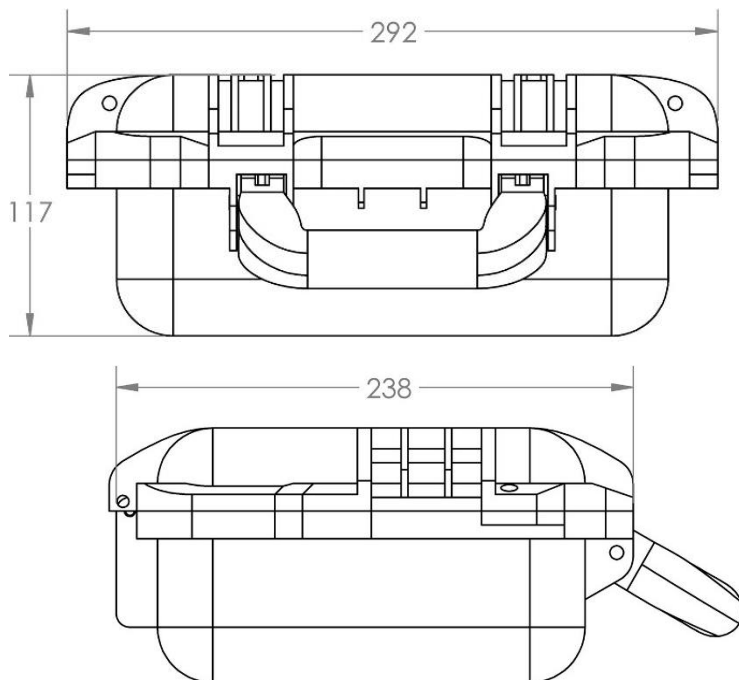
About the CALI-T50

The CALI-T50 is an irradiance reference lamp which means it is a directional lamp with intensity and spectra defined in one point in front of the lamp as shown below.

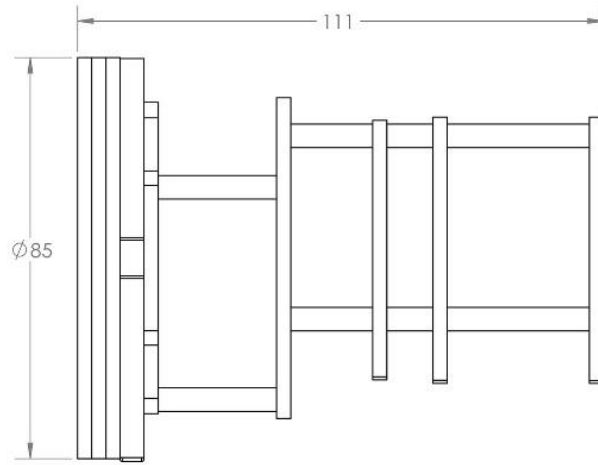


Dimensions

Outer dimensions of flight case:



Outer dimensions of the light source:



Shipping Packages	Shipping Dimensions	Shipping Volume	Weight
1. CALI-T50	400 x 300 x 250 mm	0.03 m ³	2 kg

Total shipping weight: 2 kg

The shipment is done in a total of 1 package.

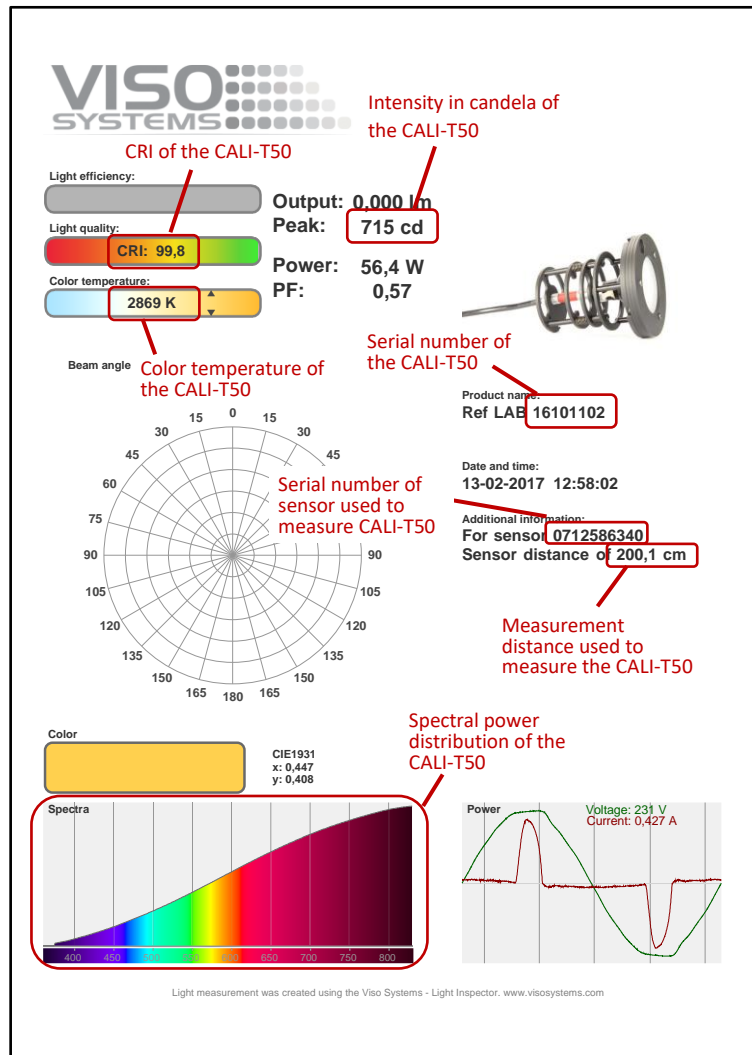
CALI-T50 Package Contents



- Smart suitcase
- Mains Power Supply Cable
- Light Source supply cable
- Test Certificate
- Instructions

The Test Certificate

The CALI-T50 comes with a test certificate as shown below.



Source lifetime

The source calibration lifetime is about 30 hours. Remember to turn off the light source as soon as possible to preserve the lamp.

If for any reason this time exceeded, the source can be re-traced to Viso's original calibration light sourced. Please contact your local distributor or Viso Systems product support.

Calibrating a Viso System

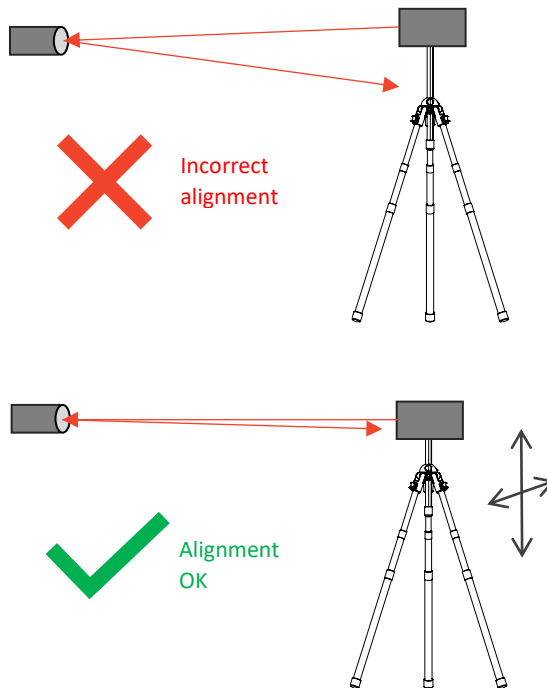
Calibration procedures are more or less the same for all Viso systems but mounting and aligning the CALI-T50 are a little different. This section will describe mounting and alignment for the three systems first, and then describe the common procedures.

LabSpion: Mounting the CALI-T50 and aligning the sensor

The very first step is to mount the reference lamp into the setup as shown in the pictures.



Then place the sensor approximately two meters away from the setup with the reference lamp. It is recommended to use approximate same distance as defined on certificate. Make sure that the sensor is aligned with the lamp. Shoot the laser towards the lamp glass and catch the reflected beam in the same area of its origin, or within a 4 cm area. Such a procedure puts both the sensor and the lamp in alignment. The pictures below explain the process:



Measuring the distance

When the sensor is aligned relative to the lamp, you can measure the precise distance between the two components. It should be between 190 and 210 cm (referring to the certificate).

Now start the distance measurement

- Press the 'Laser on' button on the back of the sensor T
- Slightly lift the laser to target beam towards the little white point above the lamp area



- Press the 'Measure distance' as shown below.



The glass surface of the lamp produces a lot of internal reflections of the laser beam, and it complicates the exact distance calculation. The precise distance determination is essential in achieving the best results. That is why a fixed white target point was designed above the lamp luminous area.

- After the distance has been measured to the point the laser back to the center of the glass.
-

BaseSpion: Mounting the CALI-T50

- The CALI-T50 can be pre-warmed or warmed up while mounted on the BaseSpion
- Use the BaseLock function to ensure that the direction of the lamp is correct

- Remove the lamp bracket on the C-plane head and mount the CALI-T50



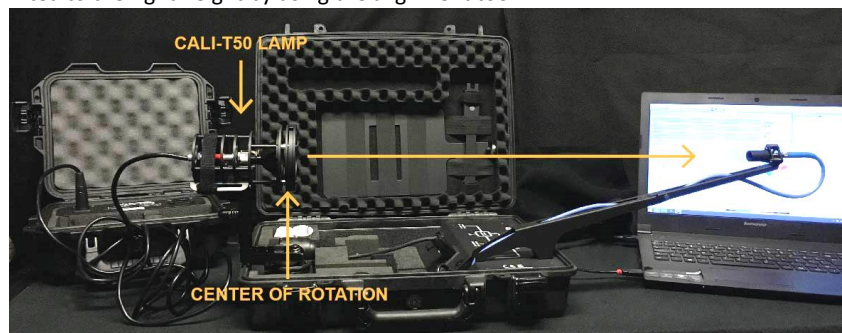
- Align the front of the thick plate with the center of rotation.



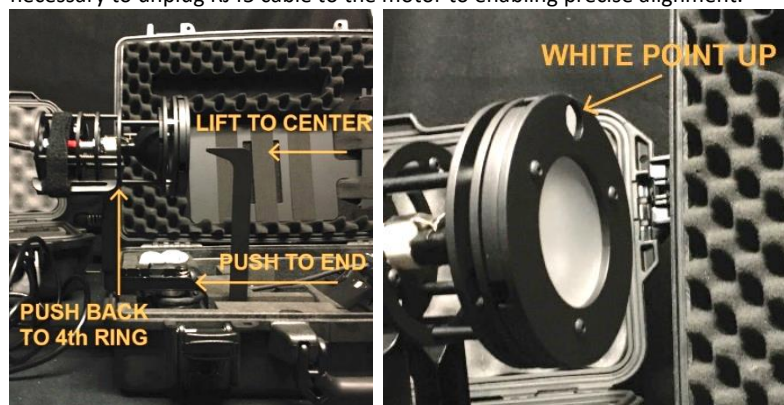
The distance to the CALI-T50 will (as always) be detected automatically by the BaseSpion.

LightSpion: Mounting the CALI-T50

Place the calibration lamp at the center of the rotation motor and make sure it is lifted to the right height by using the alignment tool.



The lamp must be pointed directly towards the sensor. Sometime is might be necessary to unplug RJ45 cable to the motor to enabling precise alignment.



Connecting Power to the CALI-T50

To turn on the lamp simply plug in the lamp to the box socket, and then connect the box to the (mains) power supply, as shown in the pictures below.



Warm-up and Stabilization

The lamp needs to ramp up, and there is an indicator with a mini instruction on the box.

- A blue flashing indicator means the lamp is ramping up,
- A constant blue color indicates that the lamp has concluded ramp up
- A red color of the indicator means that there is an error.

Then the lamp needs to stabilize for at least 30 minutes, after which it is ready for measurement.

Making a quick reference check-up of the sensor

It is easy to make a fast reference measurement where you simply test the if the measured data matches the certificate to verify that sensors calibration is intact.



When the lamp is warmed up simply turn on the spectrometer by clicking on the spectrum icon.

**Over saturated
click to auto set**

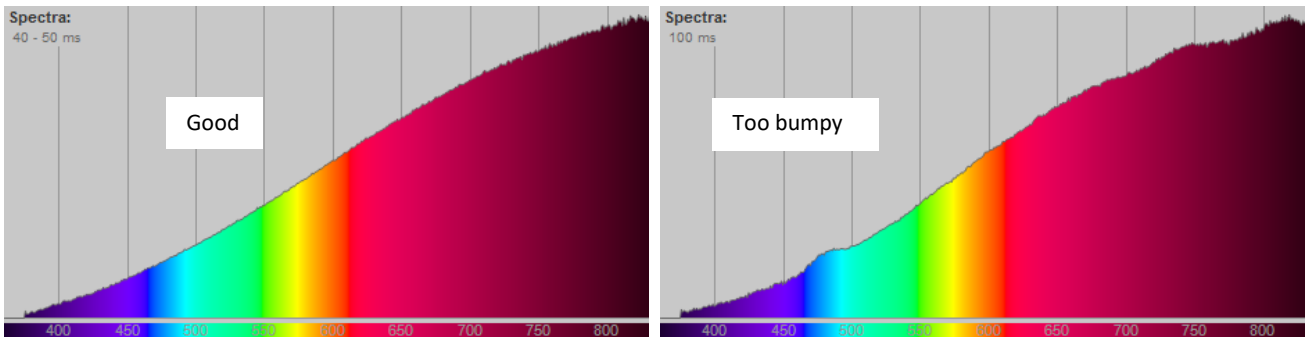
If the spectrum is over-saturated just click on the red over-saturation label to make the system to readjust the spectrometer and remove the over-saturation.

The CALI-T50 is an irradiance lamp and does not have a lumen value but only candela and photometric values at one point, so it doesn't make sense to make a complete measurement where the lamp is moved. Just turn on the spectrometer and check if the live values matches those of the certificate that came with the VISO CALI-T50. To save a live measurement, simply click the save button and save it to the log.

Remember, most likely there will be some fluctuation in values and accuracy which can be seen below.

- Candela accuracy +/- 4% (including sensor) for example for 700 cd (672-728)
- Color temperature accuracy +/- 35K

Check that the spectrum is relatively smooth as on the certificate.



Calibrating the sensor

The CALI-T50 can be used to re-calibrate your sensor. All the Viso products has two memory areas where calibration data can be stored. The first memory area contains the factory calibration and cannot be edited. But second area contains the custom calibration and can be changed by the user as many times as desired.

Before a calibration can be made you must have a lamp file (.Imp) for the CALI-T50 lamp. The lamp file specifies the CALI-T50 in $\mu\text{W}/\text{cm}^2/\text{nm}$ at 0.5 m for each wavelength, making it possible to make a full spectral and intensity calibration of the sensor.

After the CALI-T50 was originally measured by Viso Systems, all the data were uploaded to the Viso server, so it is always available for download.

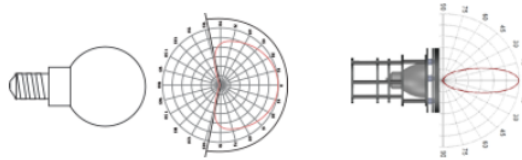
Go to <https://www.visosystems.com/reflamp/>, locate your .Imp file, and store it locally.



Type in the serial number from the CALI-T50 case or lamp, in the reference lamp database and press submit. When your lamp is found you can download the .Imp file by pressing the link. Here you also find the certificate document in pdf for the CALI-T50.

Reference lamp database

Here can you load the photometric information for your reference lamp.



Use the serial number of the reference lamp which is handwritten on the front of the power supply or reference lamp having the following format 11031601.

Or

Use the serial number of the product or sensor to get the reference lamp data which is a 10-digit number. The product or sensor serial number can be located by going into the Light Inspector software and select Help -> Calibration information.

Serial number (e.g. 11031601):

**Found: Ref LAB 16120903 with serial: 3493873288 Spectrometer:
JETI_PIC_VERSA**

[Download measurement file Ref LAB 16120903.fixture](#)

[Download PDF report Ref LAB 16120903.pdf](#)

[Download calibration lamp file Ref LAB 16120903.lmp](#)

Spectrometer Calibration – Step by Step

Calibrations steps

Step 0 Make sure the calibration light source (CALI-T50) is stable and has been turned on for the time stated by the manufacturer.

Important:

Calibrations must be made in a dark environment with non-reflective surfaces.

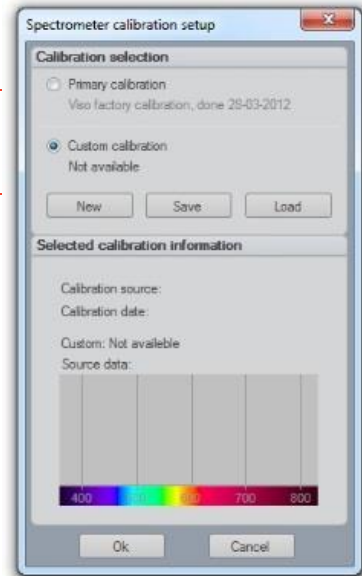
Step 1 First, you must locate the lamp file (.Imp) for the calibration lamp of your choice. Go to <https://www.visosystems.com/reflamp/>; locate your .Imp file, and store it locally.

Step 2 Then the calibration lamp must be mounted aligned as described in the manual, the distance measured and the light source warmed up as the manufacturer describes

Step 3

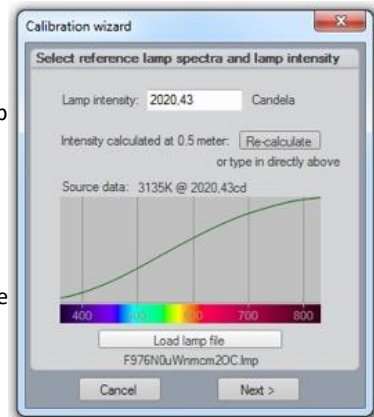
- Connect the Viso Systems goniometer via USB and open the Viso Light Inspector software.
- Select: Setup - Spectrometer calibration
- Select custom calibration
- Click 'New'.

Note: The primary factory calibration will not be lost, and you can always return to it

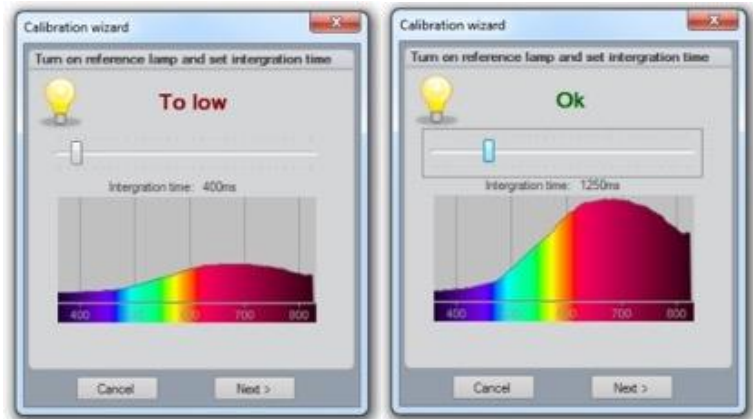


Step 4

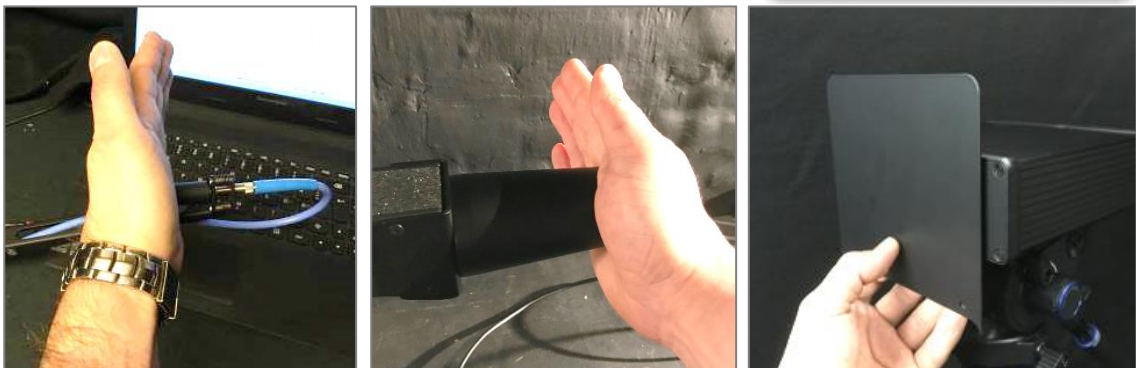
- Select "Load lamp file" and locate the lamp file to load the calibration source spectrum.
- The window showed on the right-hand side will now be populated automatically with information (intensity, spectrum etc.) from the lamp file. This information is derived from the original measurement file and form the basis for your calibration procedure.
- Advanced (normally skip this step): If you use another calibration light source than CALI_T50, then you may enter these values manually. At the top you may enter the intensity value in candela. The system will automatically base the subsequent calculations on the original lamp file referring to a 0.5 m measuring distance. If the calibration light source was measured at another distance, press the "recalculate" button to specify this.
- Click next.



- Step 5
- Set the integration time to a maximum possible value to ensure the highest resolution and thereby the best calibration quality.
 - Click next



- Step 6
- To make a dark measurement cover the sensor or turn off the calibration source so the dark reference spectrum can be measured.



- Click next and the calibration is finished.

- Step 7
- When you close the calibration dialog box you will be asked if you want to save the calibration to the device. When selecting 'yes' the custom calibration will be saved inside the device. You can switch back to the factory calibration at any time.

- Step 8
- Restart the Viso Light Inspector software and check the new calibration is stored correctly by going into Setup - Calibration.

At Viso Systems we design, develop and manufacture OEM- and customer-specific goniophotometer solutions. Our mission is to support customers with powerful and yet easy to use control measurements solutions. Products are developed and manufactured in Copenhagen, Denmark.



Light measurement made easy
