SLS205
75 W Xenon Light Source

User Guide



Table of Contents

Chapter 1 Warning Symbol Definitions 1

Chapter 2 Safety 2

Chapter 3 Product Overview 4

3.1. Xenon Light Source 4

3.2. Spectrum 4

3.3. Optical Configuration 5

Chapter 4 Operation 6

4.1. Parts List 6

4.2. Operating Elements 6

4.3. Bulb Installation 7

4.4. Switching on the Light Source 11

4.5. Status Indicator 13

4.6. Application Ideas 13

Chapter 5 Maintenance 14

5.1. Fuse Replacement 14

5.2. Bulb Replacement 15

Chapter 6 Specifications 18

Chapter 7 Mechanical Drawing 19

Chapter 8 Certifications and Compliances 20

Chapter 9 Regulatory 22

Chapter 10 Thorlabs Worldwide Contacts 23

Chapter 1 Warning Symbol Definitions

Below is a list of warning symbols you may encounter in this manual or on your device.

Symbol	Description
	Direct Current
	Alternating Current
	Both Direct and Alternating Current
	Earth Ground Terminal
	Protective Conductor Terminal
	Frame or Chassis Terminal
	Equipotentiality
	On (Supply)
	Off (Supply)
	In Position of a Bi-Stable Push Control
	Out Position of a Bi-Stable Push Control
	Caution: Risk of Electric Shock
	Caution: Hot Surface
	Caution: Risk of Danger
	Warning: Laser Radiation
	Caution: ESD Sensitive Components

Chapter 2 Safety

The lamp comes with a switching power supply compatible with voltages from 100 to 240 VAC. There is no need to change the fuse.

WARNING

Do not operate this device in explosive environments.

WARNING

Do not operate this device in wet or damp conditions.

WARNING

Do NOT look directly at the light source beam during operation. Do NOT place hand or body part in the light beam as this may cause burning.

CAUTION: HOT SURFACE

The housing of the lamp can get very hot during operation. Extensive contact may cause burning

WARNING: HOT SURFACE

The temperature of the bulb may reach a few hundred ˚C during operation. Always wait for at least 30 minutes for the bulb module to cool down before performing a bulb module replacement. Always wear gloves when handling bulb modules.

WARNING: SHOCK

High voltage inside. To avoid electrical shock, before powering unit, make sure that the protective conductor of the 3-conductor power cord is correctly connected to the protective earth contact of the socket outlet. Improper grounding can cause electric shock resulting in severe injury or even death. Do not operate without cover installed.

Chapter 3 Product Overview

3.1. Xenon Light Source

An arc lamp is a light source that generates light from gas discharge. The construction of a double ended arc lamp bulb is shown in Figure 1 mounted to the handle. The bulb consists of two metal electrodes sealed in a quartz envelope that is filled with inert gas.

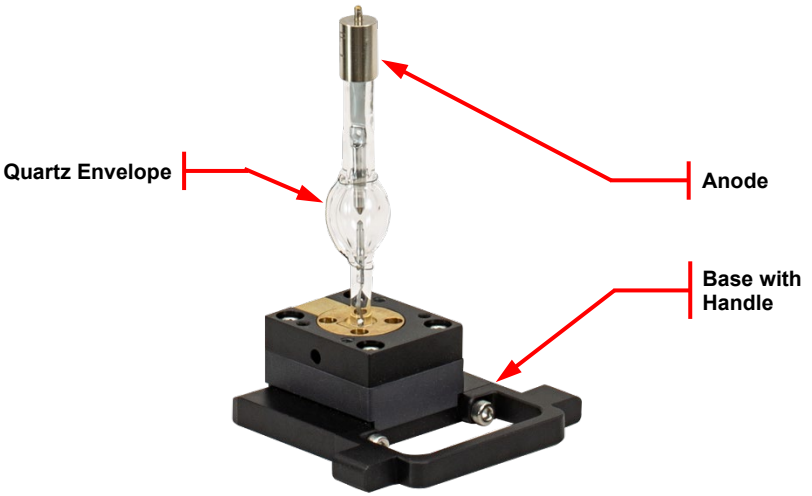


Figure 1 Structure of the Xenon Lamp Bulb Module

During ignition, high-voltage pulses are sent through the electrodes to ionize the gas in between, causing arc discharge to occur. After the arc discharge has been initiated, only a low voltage is required to maintain it. During arc discharge, a pinpoint-sized cloud of plasma in the arc will generate light with very high brightness.

3.2. Spectrum

The SLS205 Xenon Light Source provides continuous emission over the 240 to 1200 nm spectral region with intense lines between 800 and 1000 nm. Figure 2 shows the typical output spectrum of the SLS205.

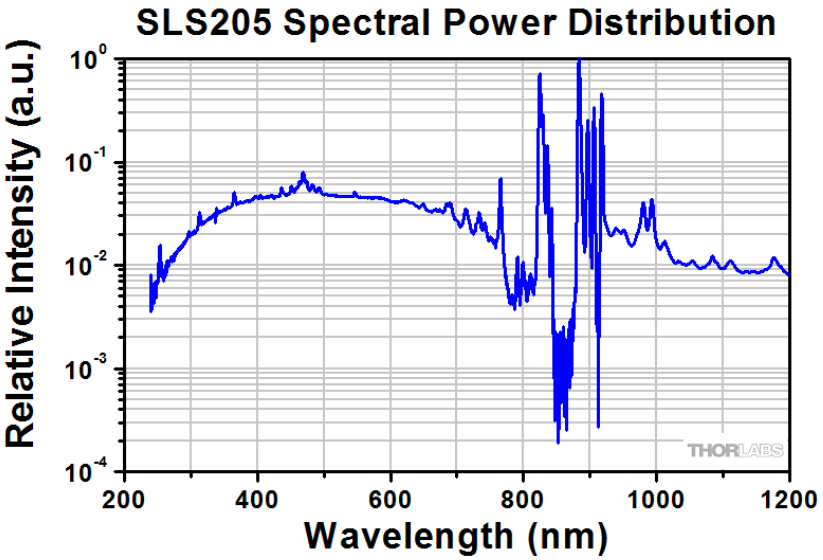


Figure 2 Typical Spectrum

3.3. Optical Configuration

The bulb is placed inside the housing, at the back focus of the first lens. This lens collimates the output light from the bulb. Then, a second lens focuses the collimated beam into a multimode fiber patch cable. The rear mirror helps to increase the coupling efficiency, providing a fiber coupled broadband light source.

The SLS205 light source includes a M111L01 fiber patch cable.

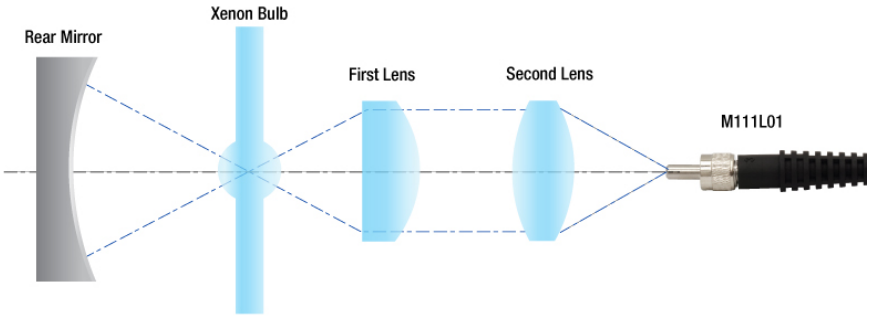


Figure 3 SLS205 Internal Optics

Chapter 4 Operation

4.1. Parts List

The package contains the items listed in the table below.

Name	Quantity
SLS205 Light Source	1
SLS255B Bulb Module	1
M111L01 Fiber Patch Cable	1
2 mm (5/64") Hex Key	1
Location-Specific Power Cord	1

4.2. Operating Elements



Figure 4 Front Panel



Figure 5 Back Panel

4.3. Bulb Installation

WARNING

Always power off the unit and disconnect the power cord before installing the bulb.

WARNING

Always wear protective gloves when handling the bulb. Moisture and grease from hands left on the bulb may affect the integrity of the bulb envelope, shortening the bulb lifetime. At worst, it could cause the bulb to burst.

WARNING

Always use both hands to open the box that stores the bulb. Always handle the bulb with extreme care when remove its shipping restraints. Always hold the bulb module by its base. Never hold the bulb by its envelop or electrodes. The bulb envelop is extremely fragile and mishandling will cause the bulb to crack or even burst.

The bulb module must be installed before operation. Please follow the steps listed in this section.

1. Make sure the light source is powered off and the power cord is disconnected.
2. Remove the bulb base from its original packaging. Always hold the module at its handle. Avoid holding the glass envelope.



Figure 6 Take out the Bulb from Packaging

3. Loosen the setscrew on the bulb base by turning it counterclockwise using the included torque driver. Remove the pre-installed dummy bulb.



Figure 7 Loosen the Four Capscrews and Remove the Dummy Bulb

4. Carefully place the 75 W Xenon short-arc bulb into the bulb base with the cathode facing down. Make sure the bulb slides all the way down the bulb base until it is in contact with the bottom of the slot.



Figure 8 Install the Bulb in the Base

5. Using the torque driver, turn the setscrew on the side of the bulb base clockwise until the driver clicks.
   Note: Failure to use the torque driver for installation will likely damage the bulb.
   Note: We recommend keeping the bulb package for future shipping use.
6. Use the included 5/64" (2 mm) hex key to loosen the 2 panel screws on the side of the light source.



Figure 9 Loosen the Two Panel Screws

7. Grip the bulb cover and pull to remove it from the housing.



Figure 10 Remove the Bulb Cover

8. Slide the bulb base into the optics base on the bottom of the lamp house.



Figure 11 Install the Bulb

9. Place the heatsink on the bulb anode.

10. Turn the thumbscrew clockwise to tighten it. The thumbscrew only needs to be finger tight. Applying too much torque on the thumbscrew

may break the bulb. Replace the side panel and tighten the panel screw with the hex key.



Figure 12 Mount the Heat Sink and Tighten the Thumbscrew

Note: Every bulb and base are paired and serialized. To achieve optimum performance, the bulb should always be used with the base with the same serial number. The serial number can be found on the bulb electrodes, the bulb package, and on the handle of the bulb base. We cannot guarantee performance if the bulb and the base do not have matching serial numbers.

4.4. Switching on the Light Source

CAUTION: HOT SURFACE

The housing of the light source can get very hot during operation. The temperature may reach ~60 °C.
Avoid extensive contact with skin.

WARNING

The light source generates UV output. Do NOT look directly at the light source beam during operation. Do NOT place hand or body part in the light beam as this may cause burning.

After setting up the light source on a work surface, follow the steps below to switch it on.

1. Ensure the rocker switch is in the “O” position. Then, connect the power cord.
2. Connect one SMA connector of the included fiber patch cable to the fiber adapter on the front panel, and lock the SMA connector.
3. Toggle the rocker switch to the “I” position to light up the lamp. After it is switched on, the status LED indicator will be on and show GREEN color if there is no error. For other status indicators, see Section 4.4.
4. Press the SHUTTER button to open the shutter. The LED on the button will be ON and light up white after the button is pressed.
5. Please allow 45 - 60 minutes for the light source to stabilize and reach a state of equilibrium.
6. To close the shutter, press the SHUTTER button again; the LED on the button will go OFF as well.
7. To power off the unit, toggle the rocker switch to “O” position.

Two shutter control modes are available for the SLS205 Xenon Light Source: manual control using the switch on the front panel and external control using the 0 - 5 V CMOS BNC port on the back panel. The BNC connection can provides up to 10 Hz (burst) shutter control with the high state (3.8 V to 5 V) closing the shutter and the low state (0 V to 1.5 V) opening the shutter. In order to switch control modes, the shutter must be closed.



Figure 13 Switching on the SLS205

4.5. Status Indicator

The LED next to the power switch indicates the status of the light source.

- If the indicator is GREEN, the device is operating under regular conditions without any error.
- If the indicator is YELLOW, the device is still operational but the bulb is close to end of life.
- If the indicator is RED, either the device has overheated, the bulb has failed to ignite, or the bulb has reached the end of life. Please power off the light source and wait for it to reach room temperature before powering on again. If the error remains, contact Thorlabs Tech Support.

Additionally, the bulb power monitor provides a voltage that can be used as a feedback signal to monitor the brightness of the bulb. This is calibrated to 2.5 V ± 0.1 V in factory for the included bulb module. The brightness of bulb varies from lot to lot. If the bulb is replaced this voltage could change +/-10%.

4.6. Application Ideas

The SLS205 Xenon Light Source provides compatibility with Thorlabs' cage system and standard SM1 (1.035"-40) optomechanics. The fiber adapter on the front panel is an SMA-SM1 fiber adapter and can be removed with a Thorlabs SPW909 Spanner Wrench to expose the internal SM1 thread.

With the fiber adapter removed, the light source operates as a free-space source. Complex optical systems can be built on to the light source utilizing the 30 mm cage system and SM1 optomechanics, as shown in Figure 7.



Figure 14 SLS205 with 30 mm Cage System and SM1 Lens Tube

It is also possible to replace the SMA-SM1 fiber adapter with other types of SM1 fiber adapter for compatibility with various types of fiber patch cables.

Chapter 5 Maintenance

5.1. Fuse Replacement

WARNING

Always power off the unit and disconnect power cord before operating a fuse replacement.

The fuse is located in the fuse drawer below the power inlet. To replace the fuse, press the two clips on the drawer and pull it out, as shown in Figure 8.



Figure 15 Fuse Replacement

Take out the used fuses and put in new ones. Please use a 3.15 A, 250 VAC, Type "T", slow blow fuse only.

5.2. Bulb Replacement

WARNING

Always power off the unit and disconnect power cord before replacing the bulb.

CAUTION

The bulb surface temperature may reach a few hundred °C during operation. Always wait at least 30 minutes after turning off the lamp for cool down before performing a bulb module replacement.

WARNING

Always wear protective gloves when handling the bulb. Moisture and grease from hands left on the bulb may affect the integrity of the bulb envelope, shortening the bulb lifetime. At worst, it could cause the bulb to explode.

WARNING

Always use both hands to open the box that storages the bulb. Always handle the bulb with extreme care when remove its shipping restraints. Always hold the bulb module on this base. Never hold the bulb on its envelop or eletrodes. The bulb envelop is extremely fragile and mishandling would cause the bulb to crack or even burst.

Thorlabs defines the end of life condition of the bulb as a drop in intensity to ≤50% of the initial output. When the lifetime of the bulb is reached, the LED indicator on the front panel will turn red. Please follow the steps listed in this section to replace the bulb.

1. Power off the unit and disconnect the power cord. Wait at least 30 minutes for the unit to cool down.
2. Use the included 5/64" (2 mm) hex key to loosen the 2 panel screws on the side of the light source.Grip the bulb cover and slide it sideways to remove it from the housing.



Figure 16 Remove the Bulb Cover

3. While holding the anode heat sink, loosen the black thumbscrew by hand, turning it counter-clockwise. Remove the heat sink and mount it on the internal side of the front panel.
4. Carefully slide out the old bulb module from the optics base. Always hold the module at its handle. Avoid holding the glass envelope.



Figure 17 Remove the Heat Sink and Take Out the Bulb

5. Carefully put the bulb back to its original package.
6. Install a new bulb by following the instruction in Section 4.3 Bulb Installation.

Chapter 6 Specifications

Name	Quantity
Wavelength Range	240 - 1200 nm (Fiber Coupled)
Bulb Electrical Power	75 W
Output Fiber	M111L01 Patch Cable (Included) Ø105 µm, 0.22 NA, SMA905 Connectors
Fiber-Coupled Output Power[1]	3.5 mW (Minimum)
Free-Space Output Power[2]	290 mW (Typical)
Fiber-Coupled Color Temperature[1]	5400 K (Typical)
Free-Space Color Temperature[2]	5800 K (Typical)
Output Power Drift	0.12% Per Hour (Typical) 0.1% Per °C (Typical)
Output Power Stability[3]	<0.5%
Bulb Life Time[4]	2000 h
Bulb Arc Gap	1.3 mm
Shutter Switch Time	5 ms
Shutter Repetition Rate (Max)	10 Hz (Burst)
Monitor	0 – 5 V Analog
External Shutter Control	0 – 5 V CMOS
Power Supply	100 - 240 VAC, 50 - 60 Hz
Operating Temperature	0 - 45 °C
Storage Temperature	-15 - 70 °C
Dimension (L x W x H)	325.6 mm x 162.5 mm x 162.8 mm (12.82" x 6.40" x 6.41")

[1] Measured with included fiber patch cable at beginning of bulb lifetime.
[2] Measured at the Output Port with the Fiber Adapter Removed at Beginning of Bulb Lifetime
[3] Standard deviation of optical power measured at room temp. over a 1 hour period (after 45 minutes of warm-up) with a 1 Hz sampling rate.
[4] Thorlabs defines the end of life condition of this light source as a drop in intensity to ≤50% of the initial output at 532 nm.

Chapter 7 Mechanical Drawing

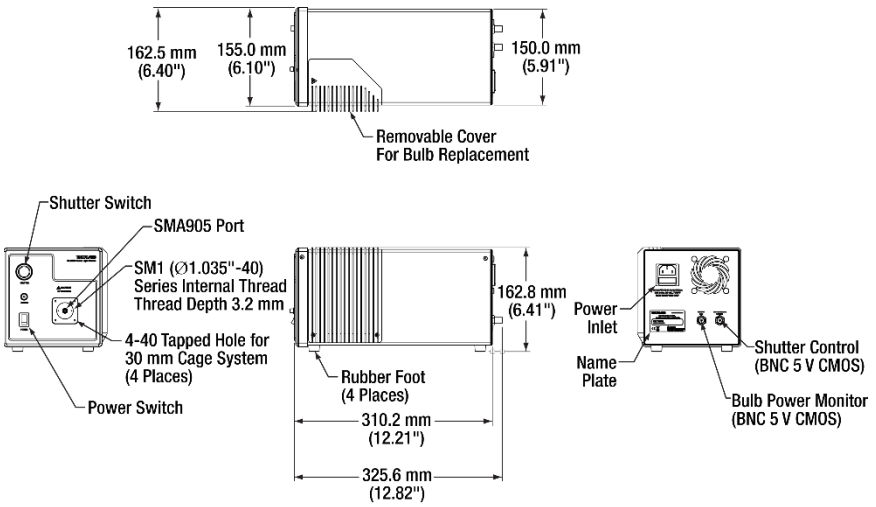


Figure 1 Mechanical Drawing

Chapter 8 Certifications and Compliances

CE

Declaration of Conformity

We: Thorlabs Optical Electronic Technology (Shanghai) Co., Ltd
of: Room A101, No.100, Lane 2891, South Qilianshan Rd, Shanghai

In accordance with the following Directive(s):

2014/35/EU	Low Voltage Directive (LVD)
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

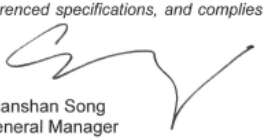
Model: ***SLS205***
Equipment: ***Fiber Coupled Xenon Light Source***

Is in conformity with the applicable requirements of the following documents:

EN 61010-1:2010 (Third Edition)
EN 61326-1:2013
EN 61326-2-1:2013
EN 61326-2-2:2013
EN 55011:2009 + A1:2010 (Class A)
IEC 61000-3-2:2014
IEC 61000-3-3:2013
IEC 61000-4-2:2008
IEC 61000-4-3:2006 + A1:2007 + A2:2010
IEC 61000-4-4:2012
IEC 61000-4-5:2014 + A1:2017
IEC 61000-4-6:2013
IEC 61000-4-8:2009
IEC 61000-4-11:2004 + A1:2017
IEC 62471-2:2009

and which, issued under the sole responsibility of Thorlabs, is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:
does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive.

I hereby declare that the equipment named has been designed to comply with the relevant section of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed:  on: 31. Oct 2019

Name: Shanshan Song
Position: General Manager

Declaration of Conformity

Thorlabs Optical Electronic Technology (Shanghai) Co., Ltd
Room A101, No.100, Lane 2891, South Qilianshan Rd., Shanghai

declares under it's own responsibility, that the product:

Fiber Coupled Xenon Light Source

Model No.: **SLS205**

fulfills the requirements of the standard

CISPR PUB. 22, FCC Part 15 Subpart B Class A

and therefore corresponds to the regulations of the directive.

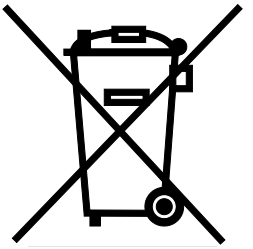
Signed:  on: 31. Oct 2019

Name: Shanshan Song
Position: General Manager

Chapter 9 Regulatory

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community and the corresponding national laws, Thorlabs offers all end users in the EC the possibility to return “end of life” units without incurring disposal charges.

- This offer is valid for Thorlabs electrical and electronic equipment:
- Sold after August 13, 2005
- Marked correspondingly with the crossed out “wheelie bin” logo (see right)
- Sold to a company or institute within the EC
- Currently owned by a company or institute within the EC
- Still complete, not disassembled and not contaminated



Wheelie Bin Logo

As the WEEE directive applies to self contained operational electrical and electronic products, this end of life take back service does not refer to other Thorlabs products, such as:

- Pure OEM products, that means assemblies to be built into a unit by the user (e.g. OEM laser driver cards)
- Components
- Mechanics and optics
- Left over parts of units disassembled by the user (PCB’s, housings etc.).

If you wish to return a Thorlabs unit for waste recovery, please contact Thorlabs or your nearest dealer for further information.

Waste Treatment is Your Own Responsibility

If you do not return an “end of life” unit to Thorlabs, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

Ecological Background

It is well known that WEEE pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS directive is to reduce the content of toxic substances in electronic products in the future.

The intent of the WEEE directive is to enforce the recycling of WEEE. A controlled recycling of end of life products will thereby avoid negative impacts on the environment.

Chapter 10 Thorlabs Worldwide Contacts

For technical support or sales inquiries, please visit us at
www.thorlabs.com/contact for our most up-to-date contact information.



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