



## **SpectroClip Probe**

### **SpectroClip-R/SpectroClip-TR/Jaz-SpectroClip-TR**

## **Installation and Operation Manual**

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**WARNING**

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Protective Eye Wear Must Be Worn When  
Using This Instrument -  
Intense Ultraviolet Radiation Present  
See Important Safety Notices inside.

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# Important Safety Notices

1. Read this manual before you attempt to use this instrument.
2. Do not remove or modify any installed safety device on this equipment. Doing so will void your warranty and create an unsafe operating environment.
3. Only allow qualified personnel to service this unit.
4. Before using the optical tool for the first time check for transport damage. Do not use the unit if it is damaged in any way. Contact your dealer for repair or replacement information.



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# About This Manual

## Document Purpose and Intended Audience

This document provides you with an installation section to get your light source up and running.

## Document Summary

| Chapter                               | Description   |
|---------------------------------------|---|
| Chapter 1: Setup and Operation        | Provides a list of package contents and unpacking instructions. Also contains a list of parts and operating instructions. |
| Chapter 2: SpectroClip Specifications | Contains product specifications.  |

## Product-Related Documentation

You can access documentation for Ocean Optics products by visiting our website at <http://www.oceanoptics.com>. Select *Technical* → *Operating Instructions*, then choose the appropriate document from the available drop-down lists. Or, use the **Search by Model Number** field at the bottom of the web page.

You can also access operating instructions for Ocean Optics products on the *Software and Technical Resources* CD included with the system.

Engineering-level documentation is located on our website at *Technical* → *Engineering Docs*.

## Upgrades

Occasionally, you may find that you need Ocean Optics to make a change or an upgrade to your system. To facilitate these changes, you must first contact Customer Support and obtain a Return Merchandise Authorization (RMA) number. Please contact an Ocean Optics Application Scientist for specific instructions when returning a product.





# Setup and Operation

## Overview

The SpectroClip probe is designed to measure thin materials such as leaves and other thin samples in the field. Transmission, reflection and absorbance can be measured on materials with a maximum thickness of 5 mm. SpectroClip features specially designed integrating spheres that function as collection probes and can be connected to any Ocean Optics spectrometer to acquire data. The top integrating sphere also includes an input port for a fiber-coupled light source to illuminate your sample. SpectroClip's integrating spheres capture diffuse reflected or transmitted light more efficiently than lens-based collection optics.



**Jaz-SpectroClip-TR**

SpectroClip can support wavelength ranges from 200-2500 nm -- depending on which light source, fiber (UV-VIS or VIS-NIR) or spectrometer configuration you use. The active illuminated area is 5 mm.

# SpectroClip Models

SpectroClip includes the following models:

| Model              | Purpose   | Included Equipment  | Other Recommended Equipment*   |
|--------------------|---|---|--|
| SpectroClip-R      | Collects reflected light from the sample  | One integrating sphere  | Spectrometer, one light source, two fibers                               |
| SpectroClip-TR     | Collects both transmitted and reflected light from the sample                         | Two integrating spheres   | Two spectrometers (or one 2-channel Jaz), one light source, three fibers |
| Jaz-SpectroClip-TR | Performs transmission and reflectance characterization of (thin) samples in the field | Two integrating spheres; a Jaz spectrometer (400 – 1000 nm) with two spectrometer channels, a tungsten-halogen light source module, and a battery module; 3 fibers, and the Spectro-Clip-TR probe | N/A  |

\* Fibers are sold separately. The recommend fiber core is 600  $\mu\text{m}$  or larger because of the attenuation of the sphere.

## Unpacking SpectroClip

The following sections provide instructions on unpacking and setting up your SpectroClip.

Before using the SpectroClip for the first time, check for transport damage. Be sure to adhere to all warnings on the unit and in this manual.

### ► Procedure

1. Unpack your SpectroClip device carefully.
2. Inspect the outside of the instrument and make sure that there is no damage. Do not use the instrument if damage is present.
3. Detach the outer side of the fiber protection and inspect the SMA connectors. Do not use the instrument if damage is present.

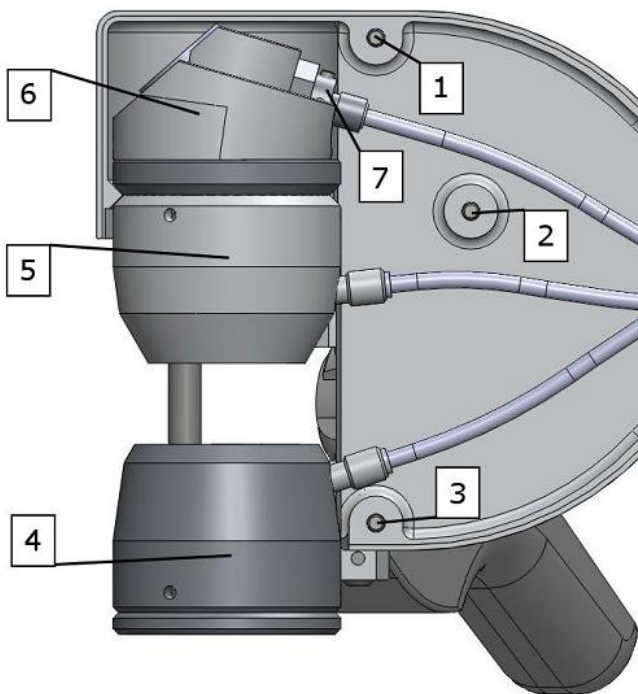
# Package Contents

Your SpectroClip package should contain the following:

- ❑ SpectroClip device (plus Jaz spectrometer for Jaz-SpectroClip-TR)
- ❑ Black and white reference device
- ❑ Spiral coiled tube 1.5 meters long (for fiber protection)
- ❑ Hexagonal socket screw keys SW 2.5 mm and SW 1.3 mm

# SpectroClip Parts

For optimal optical measurements, take care that no objects or liquids enter into the integrating spheres. To do this, use protection caps on open SMA connectors, and keep the gripper closed while not using the SpectroClip. In addition, keep the reference clean and undamaged for best reference measurements.



- 1 – 3** Screw holes for connecting the outer fiber Protection cover.
- 4** SpectroClip-R: Gripping jaw  
SpectroClip-TR: Integrating sphere for transmission measurements
- 5** Integrating sphere for reflection measurements
- 6** Optical assembly for the 8° illumination
- 7** Focusable SMA connector

# Using SpectroClip

The procedure for using your SpectroClip differs, depending on which model you have.

## Using SpectroClip-R

### ► Procedure

1. Unscrew one part of the fiber cover.
2. Slip the spiral coiled tubes over the fibers.
3. Connect the two fibers to the SMA connectors. You shouldn't use a fiber thicker than 400  $\mu\text{m}$  on the focusable SMA connector from the picture above.
4. Assemble the fiber cover and tighten the three screws. The spiral coiled tube should begin inside the fiber cover.
5. To record a dark spectrum use the black/ white reference with the black side turned to the reflectance sphere.
6. To record a reference spectrum use the black/ white reference with the white side turned to the reflectance sphere.
7. Clamp your measuring object into your SpectroClip and start the measurement.

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### Caution

**For mechanical reasons, you can use samples with a height of up to 15 mm only.**

**Avoid stray light. During your measurement there should be no light bypassing your sample.**

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## Using SpectroClip-TR

1. Unscrew one part of the fiber cover.
2. Slip the spiral coiled tubes over the fibers.
3. Connect three fibers to the SMA connectors. If you don't use all SMA connectors cover the empty connector with a protection cap.

4. Assemble the fiber cover and tighten the three screws. The spiral coiled tube should begin inside the fiber cover.
5. To record a dark spectrum, use the black/ white reference with the black side turned to the reflectance sphere.
6. To record a reference spectrum use your SpectroClip without any object between the clamps.
7. Clamp your measuring object into your SpectroClip and start the measurement.

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**Caution**

**Don't use samples thicker than 5 mm. With thicker samples, the amount of unwanted stray light increases.**

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## Transmission Measurement Loss of Intensity

It is recommended to use the same distance between integrating spheres to measure the reference spectra as was used for the sample measurement. The loss of intensity for a port difference of 1 mm is 3 % @620 nm with respect to zero difference. Other losses of intensity for the reference spectra are shown in the table below.

**Fiber and Diameter Distances (Valid for Optical Alignment)**

| Fiber Diameter ( $\mu\text{m}$ ) | Maximum Port Difference | Loss in Reference Spectrum (relative to 0 distance) |
|----------------------------------|-------------------------|---|
| 100                              | 8                       | 10%   |
| 400                              | 4                       | 10%   |

## Adjustment of the 8° Coupling Port

You can adjust the focus of the light beam between the upper fiber and the opening of the reflectance sphere.

► **Procedure**

To adjust the focus,

1. Loosen the screw on the SMA connector (#7 in [SpectroClip Parts](#)) with the hexagon socket screw key (SW 1.3 mm).
2. Move the SMA connector for optical performance.
3. Block the screw after adjustment.



# SpectroClip Specifications

| Specification                      | Value                 |
|------------------------------------|-----------------------|
| Size (without fibers)(LxHxW)       | 22 cm x 12 cm x 17 cm |
| Weight (without fibers)            | 500 g                 |
| Wavelength Range<br>(Spectrometer) | Spectralon®           |

## 2: SpectroClip Specifications

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