

**SVA 1**  
**Single-mode Fiber Optic Variable**  
**Attenuator**  
**User's Guide**

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## Limited Warranty

### One Year Limited Warranty

All Noyes products are warranted against defective material and workmanship for a period of one year from the date of shipment to the original customer. Any product found to be defective within the warranty period will be repaired or replaced by Noyes. In no case will Noyes liabilities exceed the original purchase price of the product.

### Exclusions

The warranty on your equipment shall not apply to defects resulting from the following:

- Unauthorized repair or modification
- Misuse, negligence, or accident

### CE Information



These instruments have been designed and tested to comply with the relevant sections of

any applicable specifications including full compliance with all essential requirements of all applicable EU Directives.

### Returning Equipment

To return equipment, please contact Noyes to obtain additional information and a Service Request (S.R.) number. To allow us to serve you more efficiently, please include a brief description specifying the reasons for the return of the equipment.

### AFL Telecommunications

Noyes Test & Inspection  
16 Eastgate Park Road  
Belmont, NH 03220  
Phone: 800-321-5298  
603-528-7780  
Fax: 603-528-2025

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## Safety Information



**CAUTION!** To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers. Refer to your company's safety procedures when working with optical systems.



**NOTICE!** An SVA 1 Single-mode Variable Attenuator contains no user serviceable parts. Except for cleaning optical ports, this instrument must be returned to Noyes or authorized agents for repair.

**IMPORTANT!** Proper care in handling should be taken when using any precision optical test equipment. Scratched or contaminated optical connectors can impact the performance of the instrument. It is important to keep the dust caps in place when the unit is not being used.

## Section 1: General Information

Thank you for purchasing a Noyes SVA 1 Single-mode Variable Attenuator. The purpose of this user's guide is to explain how to use and maintain this instrument. Please check our web site at **[www.AFLtele.com](http://www.AFLtele.com)** (**click on Products > Noyes Test & Inspection**) for updates to this manual and additional application information. If you have any questions about your instrument and recommended accessories, or if you need technical or sales support, please contact Noyes Customer Service.

### Contacting Noyes Customer Service

You may call Noyes Customer Service between 8 a.m. and 5 p.m., United States Eastern Time, as follows:

**Phone:** 800-321-5298

603-528-7780

**Fax:** 603-528-2025

**Web:** [www.AFLtele.com](http://www.AFLtele.com) (click on Products > Noyes Test & Inspection)

### Unpacking and Inspection

This instrument has been carefully packed in accordance with standard shipping procedures. Examine the equipment for damage that may have occurred during shipment. If you find any damage, please contact Noyes.

## Feature Overview

The SVA 1 Single-mode Variable Attenuator advances fiber optic field testing by offering superior performance in a low cost hand-held package. Utilizing a simplified, industry accepted attenuation technique, the innovative design of the SVA 1 offers superior resolution across the entire 60 dB dynamic range. Intended for field testing during installation, new equipment turn-ups, or routine maintenance, the SVA 1 is a complete, easy to use attenuator. Its unique features allow bidirectional signal transmission with no loss penalty.

The SVA 1 is available with a variety of connectors and reflectance options (better than 60 dB). With only two adjustments, COARSE and FINE, the SVA 1 is simple to understand and operate. The SVA 1 is suited for all single-mode applications including Telco, LANs, WANs, Video, and CATV.

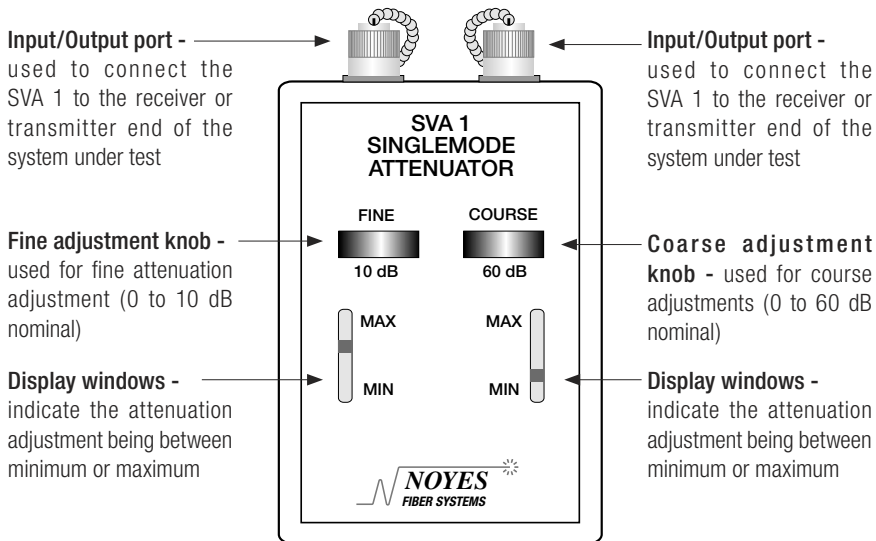
## Recommended Accessories

You will need fiber optic test jumpers to connect your SVA 1 to the system under test. Test jumpers must have the same core and cladding size as the fiber under test. Test jumpers require the appropriate connectors on each end to match to the system's connector style and the output connector on the SVA 1. Test cables and jumpers with a variety of lengths and connector styles are available from Noyes.

A supply of optical cleaning pads and isopropyl alcohol or a connector-cleaning cartridge is recommended to clean the optical connectors on your SVA 1 and test cables. A supply of fiber optic cleaning swabs or a can of filtered compressed air is recommended for cleaning connector adapters. Noyes recommends using our new non-flammable, environmentally safe Fiber Optic Cleaning solution and molded dual-head connector end-face cleaning tips.

## Section 2: Functional Description

### SVA 1 Front Panel





## Section 3: Applications

### System Margin Test

The SVA 1 is used effectively during system margin measurements. To measure the system margin, first measure the absolute power in dBm of the transmitter with an optical power meter and record the measured **NON-ATTENUATED** power level.

#### step I - measure optical power of the transmitter

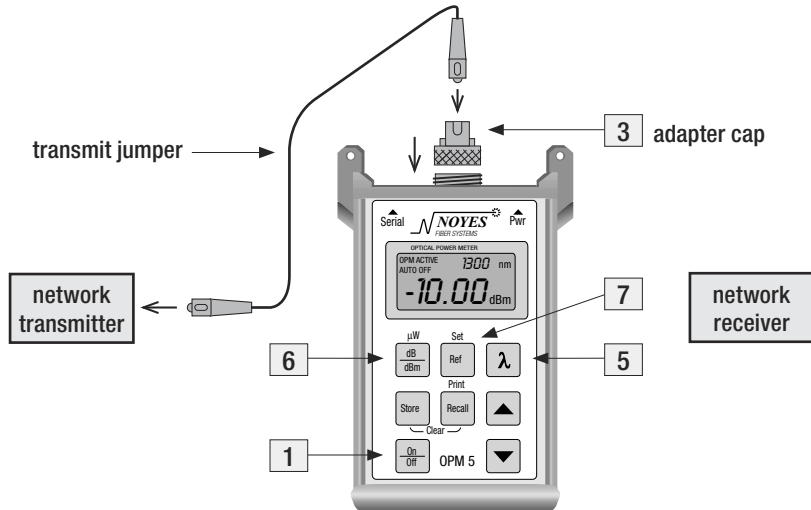
In the following procedures the Noyes OPM 5 optical power meter is used to perform measurements.

- 1 Turn on the OPM 5 optical power meter (refer to Figure, page 5).
- 2 Select the appropriate fiber optic test jumper.

**Note:** The fiber type of this jumper must be the same as the fiber type normally connected to the output being measured.

- 3 Mount the appropriate adapter cap on the OPM 5 optical input. This adapter cap must match the connector on the end of the test jumper you will connect to the OPM 5.
- 4 Connect one end of the test jumper to the OPM 5 (adapter cap) and the other end to the optical output to be measured.
- 5 Press the  $\lambda$  key to select the calibrated wavelength that matches the nominal wavelength of the source being measured.

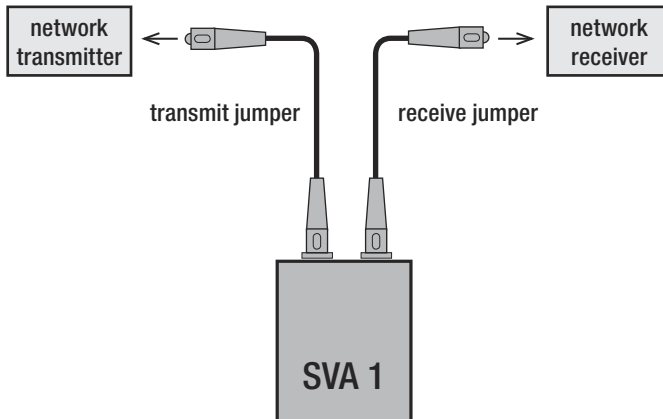
- 6 Press the **[dB/dBm]** key to display power in dBm - this is the measured **NON-ATTENUATED** power level. If using a power meter other than OPM 5 or OPM 4, record this measurement.
- 7 Press and hold the **REF** key until “HELD” appears to set the reference level at the current wavelength. The OPM 5 should display “0 dB”  $\pm 0.05$  dB.



**Note:** The high return isolation of the attenuator assures that the transmitter is not adversely affected by reflected power.

## step II - insert SVA 1 between transmitter and receiver

- 8 Insert the SVA 1 attenuator between the transmitter and receiver.
- 9 Increase the attenuation by turning the Fine or Course knobs until the Bit Error Rate exceeds the specified minimum rate.

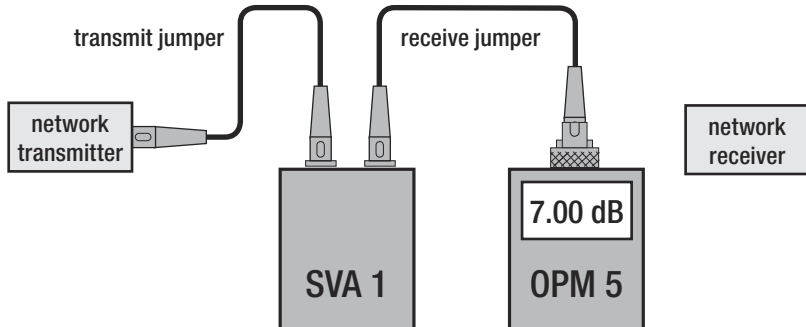


### step III - measure system margin

10 Disconnect the receive jumper at the receiver and connect it to the OPM 5 optical power meter. The **ATTENUATED** power level will automatically be displayed. In diagram below, the OPM 5 indicates an additional 7 dB of loss that is available before system failure. Changing the display reading to dBm gives the absolute level at which system failure occurred. This level should be within the receiver manufacturer specifications.

!!! If using an optical power meter other than OPM 5 or OPM 4, calculate the system margin by subtracting the **NON-ATTENUATED** power level from the **ATTENUATED** power level.

**Note:** Adjusted attenuation is wavelength dependent. Confirm loss levels when changing light source.



## Receiver Sensitivity Test

If the power measured by an optical power meter is too high or “hot” for the receiver, perform the following steps:

- 1 Insert the SVA 1 attenuator between the transmitter and receiver.
- 2 Increase the attenuation by turning the Fine or Course knobs until the system operates properly.
- 3 Connect the optical power meter to the SVA 1 to measure the attenuated power.
- 4 The loss displayed on the optical power meter is the attenuation required to bring the system within specifications of the receiver.

**Note:** A fixed attenuator of the appropriate value can then be permanently inserted in the system. This process is referred to as “padding the system”.

## Section 4: Maintenance

### **Cleaning the Optical Ports**

It is important to keep all optical connections and surfaces free from dirt, oils, or other contamination to ensure proper operation. Scratched or contaminated connectors can reduce system performance.

Optical ports must be kept free from dirt or other contaminants to ensure accurate measurements and operation. A supply of optical cleaning pads and isopropyl alcohol is recommended to clean the optical ports.

Noyes recommends using our new non-flammable, environmentally safe Fiber Optic Cleaning solution and molded dual-head connector end-face cleaning tips.

It is important to keep the dust cap in place when the unit is not being used.

## Section 5: Specifications

### SVA 1 Specifications

Specified Wavelengths	1310 nm & 1550 nm $\pm$ 30 nm
Insertion Loss	$\leq$ 1.5 dB @ 1310 nm
Minimum Attenuation	60 dB
Return Loss	50 dB ( $\geq$ 60 dB optional - angled FC)
Coarse Adjustment	0 to 60 dB nominal
Fine Adjustment	0 to 10 dB nominal
Standard Connector	FC, ST, SC
Operating Temperature (°C)	-10 to +55
Storage Temperature (°C)	-30 to 60
Dimensions	5.5" H x 2.75" W x 1.5" D (14 x 7 x 3.8 cm)
Weight	0.4 lb. (0.2 kg)

**Thank you for choosing Noyes Test & Inspection**

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