A Furukawa Company

Your Optical Fiber Solutions Partner®

Insertion Loss Test Kit

For Use With:

50, 62.5, 200, & 400 µm
HCS® Cable Assemblies

ST, SMA, V-Pin and F07
OFS Connectors

Important Safety and Warranty Information

Precautions To Take

CAUTION:
Never look directly into the output ports of the Light Source or the ends of a fiber optic connector. The light may not always be visible, but can still cause damage to the eye. It is the responsibility of the user to ensure their eyes and the eyes of those around them are not exposed to light emitted from the Light Source or the optical connectors.

IMPORTANT:
Keep all optical ends clean to avoid poor insertion loss readings and also to prevent contamination of the optical ports and detectors on the test units. Use isopropyl alcohol, lint free wipes, and filtered compressed gas to clean dirty connector ends. Always replace the protective dust caps onto the optical ports when not in use.

WARRANTY:
One year Limited Warranty: OFS Test Kits 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 would be repaired or replaced. In no case will OFS' 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 modifications
- Misuse, negligence or accident

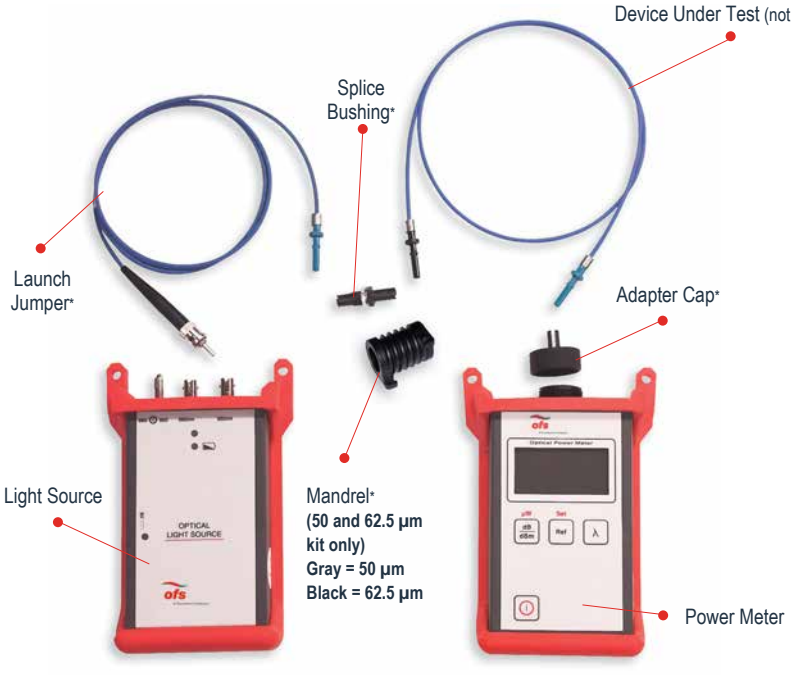
CONTACT:
For technical support, please contact the sales representative in your region or call the factory:

Monday-Friday, 8:00 am-5:00 pm EST.

888-438-9936 [Toll free in the US and Canada]
860-678-0371 [International]

Table of Contents

Complete Test Sets Sold Separately



V-Pin Connectors Pictured.
*Parts Vary by Test Set Connector Type and Size.

All kits include:

- Light Source and Power Meter
- Quick Start Guide and Owner's Manual

Each kit also includes **custom components** which correspond to the type of connector(s) being tested and the size of the fiber.

- Adapter Cap(s)
- Factory-Connectorized launch jumper(s)
- Splice Bushing(s)

Continued onto next page →

Complete Test Sets Sold Separately

Insertion Loss Test Kits

Each kit includes corresponding jumpers, splice bushings and adapter caps.

for this HCS fiber size	with these connectors	Part Number
50 µm	ST	P10188-10
62.5 µm	ST	P10188-10
200 µm	V-Pin	P10188-01
400 µm	V-Pin	P10188-02
200 µm	ST	P10188-03
400 µm	ST	P10188-04
200 µm	SMA	P10188-05
400 µm	SMA	P10188-06
200 µm	F07	P10188-07
200 µm Multi Test Set	V-Pin, ST, SMA and F07	P10188-08
400 µm Multi Test Set	V-Pin, ST and SMA	P10188-09

Specifications

Data applies to all Part Numbers

Optical Specifications

Detector type	Silicon (Si)
Calibrated wavelengths	660 nm, 850 nm
Accuracy (@25°C and -10 dB/m)	±0.25 dB
Resolution	0.01 dB

General Specifications

Operating temperature range	0°C to +50°C
Storage temperature range	-30°C to +60°C
Relative humidity range	0 to 95% (non-condensing)
Dimensions (H x W x D)	5.5 x 3.2 x 1.5 inches
Connector interface	ST, SMA, V-Pin, F07 available
Battery life	60 hours typical with 9V alkaline

Related Products and Accessories Sold Separately

Accessories

Part Numbers	Description
P10199-01	V-Pin Adapter Cap
P10199-02	ST Adapter Cap
P10199-03	SMA Adapter Cap
P10199-04	F07 Adapter Cap
AP04707	V-Pin Splice Bushing
AP01960	ST Splice Bushing
AP01618	SMA Splice Bushing
AP02719	F07 Splice Bushing
K19102	62.5 µm Launch Mandrel
K22261	50 µm Launch Mandrel

Part Numbers	Description
P10198-01	V-Pin 200 µm Launch Jumper Set
P10198-02	V-Pin 400 µm Launch Jumper Set
P10198-10	ST 50 µm Launch Jumper
P10198-08	ST 62.5 µm Launch Jumper
P10198-03	ST 200 µm Launch Jumper
P10198-04	ST 400 µm Launch Jumper
P10198-05	SMA 200 µm Launch Jumper
P10198-06	SMA 400 µm Launch Jumper
P10198-07	F07 200 µm Launch Jumper

Function Definitions and Descriptions

V-Pin Connectors Pictured.
*Parts Vary by Test Set Connector Type and Size.

Device Under Test
The connectorized cable assembly being tested.

Light Source
Emits light at both 660 nm and 850 nm wavelengths.

Power Meter
Also known as a **Detector**, the device with a window display showing dB loss.

Launch Jumper
A "golden" reference jumper assembly of known good quality. OFS launch jumpers are available with an ST connector on one end for compatibility with the Light Source, and various connectors on the opposite end depending on what type of connectors the device under test is terminated with. The fiber type of the launch jumper must be the same as the fiber type of the device under test. See "Related Products and Accessories" section for available launch jumper types.

Adapter Cap
Screws onto detector head of Power Meter to allow for mating of connector to Power Meter. See "Related Products and Accessories" section for available styles. Style of adapter cap should match the connector type of the device under test.

Splice Bushing
Also often referred to as a mating adapter. Allows mating of two connectors. Style of splice bushing should match the connector type of the device under test. See "Related Products and Accessories" section for available splice bushings.

Continued onto next page →

Function Definitions and Descriptions

Power Switch ⏻

Pressing this button turns the power meter on or off. The power meter will automatically turn itself off to conserve battery life if no keys have been pressed for approximately 5 minutes. To disable the automatic shut down, hold down the ⏻ button during power up until "P" appears on the display.

dB/dBm Button

Pressing this button switches the measurement mode from absolute power (dBm) to loss (dB). OFS procedures outlined in this manual for simple insertion loss measurements utilize the "dB" mode.

Ref Button

Pressing and holding down this button until "HELD" appears on the display stores the "zero" reference for the launch jumper.

λ

The Greek symbol lambda (λ) is used to denote wavelength. Pressing this button selects the wavelength desired. Also, holding this button down until "HELD" is displayed will show the percentage of battery life remaining.

Insertion Loss Testing Overview

Single Ended Method

- A test launch jumper is connected to a source and a detector as shown in Figure 1. The detector is "zeroed" to eliminate the effects of loss through both the launch jumper and the connection between the launch jumper and source.

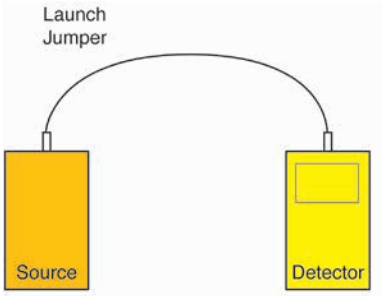
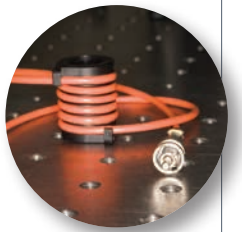


Figure 1



NOTE:
V-System kits are configured for Substitution Method. All other kits are configured to use the Single Ended Method.

For 50 and 62.5 µm testing only, an additional step is required: Wind the launch jumper around the mandrel (provided with the 50 and 62.5 µm kit only), ensuring the cable follows each groove and is clipped into both ends of the mandrel where pinch ports are evident. The mandrel should be wound within approximately a half meter of the source connector end. (**See photo at left.**)

Use the gray mandrel for 50 µm.
Use the black mandrel for 62.5 µm.

Continued onto next page →

Insertion Loss Testing Overview

Single Ended Method continued

- The test launch jumper is disconnected from the detector and connected to connector end “X” of the device under test via a splice bushing. Connector end “Y” of the device under test is connected to the detector. See Figure 2. The detector displays dB loss which represents optical power loss at the “X” connection (due to misalignment, concentricity, angularity, etc.) plus the loss due to attenuation through the length of fiber in the device under test.

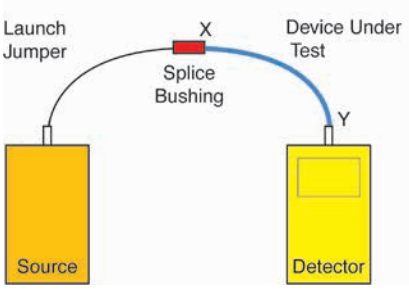


Figure 2

Substitution Method

- Two test launch jumpers are connected to a source and a detector as shown in Figure 3. The detector is "zeroed" to eliminate the effects of loss through the launch jumper and source.

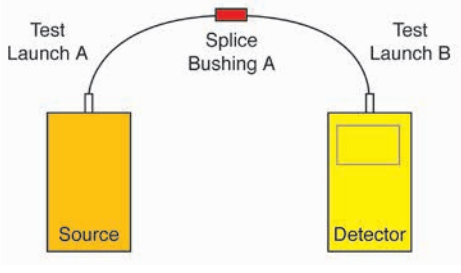


Figure 3

NOTE:
V-System® kits are configured for Substitution Method. All other kits are configured to use the Single Ended Method.

Continued onto next page →

Insertion Loss Testing Overview

Substitution Method continued

- The test launch jumpers A and B are disconnected at Splice Bushing A. Connector ends “X” and “Y” of the device under test are connected to Splice Bushings A and B, respectively (see Figure 4). The detector displays dB loss which represents optical power loss at the “X” connection (due to misalignment, concentricity, angularity, etc.) plus the loss at the “Y” connection, plus attenuation through the length of fiber in the device under test.

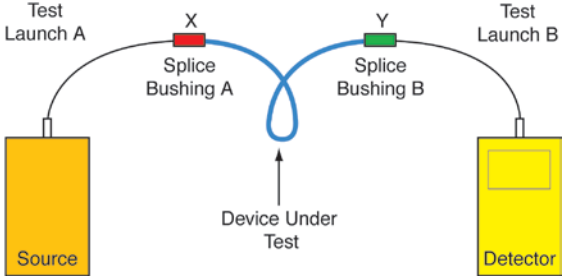
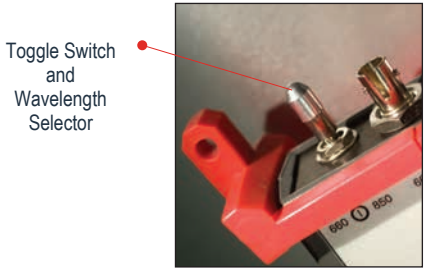


Figure 4

Insertion Loss Test Procedure

STEP 1

- Turn “ON” Light Source by pulling up on the toggle switch and moving to left or right to select the appropriate wavelength.



NOTE:
To turn “OFF” light source, pull up on toggle switch and move to center position.

Insertion Loss Test Procedure

STEP 2

- Turn “ON” the Power Meter by pressing the On/Off button.
- Press the dB/dBm button until “dB” is displayed.
- Press the λ button until the appropriate wavelength is displayed.
- Remove protective caps from Source and Meter.
- Install appropriate Adapter Cap onto the Power Meter.
- Allow 2 minutes for the test set to stabilize.

NOTE:
To disable the 5-minute auto-off feature, hold down the “On/Off” button during power up until a “P” appears on the display.

STEP 3

For Single Ended Method See Figure 1 on page 4.

- Insert ST connector end of Launch Jumper into appropriate wavelength port on Light Source.
- Insert other connector end of Launch Jumper into Adapter Cap on Power Meter.
- "Zero" the Power Meter by pressing and holding down the "Ref" button until "HELD" and "0.00 dB" is displayed.

For Substitution Method See Figure 3 on page 6.

- Insert ST connector end of Launch Jumper into appropriate wavelength port on Light Source.
- Insert connector of the Second Launch Jumper into Adapter Cap on Power Meter.
- Connect the two Launch Jumpers with a Splice Bushing.
- "Zero" the Power Meter by pressing and holding down the "Ref" button until "HELD" and "0.00 dB" is displayed.

NOTE:
It is recommended to repeat this "zero" procedure at least every 30 minutes.

For 50 and 62.5 µm testing only, an additional step is required: Wind the launch jumper around the mandrel (provided with the 50 and 62.5 µm kit only), ensuring the cable follows each groove and is clipped into both ends of the mandrel where pinch ports are evident. The mandrel should be wound within approximately a half meter of the source connector end. (**See photo at left.**)

Use the gray mandrel for 50 µm.
Use the black mandrel for 62.5 µm.

Insertion Loss Test Procedure

STEP 4

For Single Ended Method See Figure 2 on page 5.

- Disconnect connector end of Launch Jumper from Adapter Cap on Power Meter and insert into Splice Bushing.
- Insert one connector end of the Device Under Test into the Splice Bushing.
- Insert the other connector end of the Device Under Test into the Adapter Cap on the Power Meter.
- The number on the Power Meter display represents the insertion loss due to the connector at the Splice Bushing plus the attenuation through the length of cable.

For Substitution Method See Figure 4 on page 7.

- Disconnect second Launch Jumper from Splice Bushing. Then insert into Second Splice Bushing.
- Install the Device Under Test between the two Splice Bushings.
- The number on the Power Meter display represents the insertion loss due to the connector at the Splice Bushing that is closer to the Light Source, plus the attenuation through the length of cable in the Device Under Test.

Trouble Shooting Guide

Problem	Solution
High loss on device under test	Ensure fiber is crimped and cleaved properly. Read trouble shooting guide in termination kit instruction booklet. Ensure you used the appropriate mandrel in the correct location on the launch jumper attached to the source.
Power meter set at dBm instead of dB	Push dB/dBm button on power meter to switch to dB mode “dB” will appear on LCD.
Reference value on power meter has drifted from 0.00 dB	Re-zero the power meter, launch the light source to reset the test reference number.
No light signal in Device Under Test	Device Under Test is damaged - re-terminate or replace.
“Bat” appears on LCD of power meter	Replace 9-volt battery. Low battery on light source or power meter “Bat” indicates need for battery replacement.

Problem	Solution
Unable to plug in device under test to test unit or splice bushing	Incorrect launch jumper, splice bushing, adapter cap. Test equipment must match the fiber types and connector type that is being tested.
Dirty fiber optic ends	All fiber optic ends must be free of dirt, oils (finger oils), dust and contaminates. Use isopropyl alcohol, lint-free wipes, and filtered compressed air to clean dirty ends. Always keep rubber dust caps on fiber optic connectors and test equipment when not in use.
Light source or power meter set at incorrect wavelength	Check both meter settings: V-system: 660 nm ST, SMA, F07: 850 nm
Damaged launch cable	Contact factory to replace.

Maintenance & Calibration

To replace the 9-volt battery, remove the unit from its protective rubber boot and remove the compartment cover (located on back of unit) by sliding the cover away from the unit in the direction indicated by the arrow on the cover.

Keep all optical ends clean to avoid poor insertion loss readings and also to prevent contamination of the optical ports and ends. Always replace the protective dust caps onto the optical ports when not in use.

Repair of the test units beyond battery replacement is not recommended in the field. Return to OFS for repair.

Calibration of the test units is recommended once per year. **Contact OFS 888 438 9936 [US & Canada] or 860 678 0371 for proper calibration.**

0815

55 Darling Drive, Avon, CT 06001

To learn more, please call or visit our website.

Phone: **1 860 678 0371**
Toll Free: **1 888 438 9936**
Web: **www.ofsoptics.com**

P10672 Rev. K

Trademark Information: