Passive Component Test Solutions

JDSU

JDSU Test Solutions

With more than 20 years of innovation in fiber optic test and measurement, JDSU is committed to delivering indsutry-leading, cost-effective solutions for passive component testing. Precise, durable, and uniquely scalable, JDSU passive component test solutions form the backbone of research and development (R&D), validation, and manufacturing test processes. JDSU solutions focus on measuring Insertion Loss (IL), Return Loss (RL), Polarization Dependent Loss (PDL), along with visual/cleaning inspection of connectors, across key wavelengths and qualification environments. These tools deliver the reliable measurement results needed to help you meet your customer commitments.

Solutions for the full spectrum of technologies

JDSU passive component test solutions are applicable to the full range of optical connectors, cables, components, and modules used by today's network architectures including:

– multimode cable and connectors for SAN and enterprise

– broadband components and cables for FTTx

– CWDM for PON and access networks

– DWDM / ROADM modules for metro and long haul networks

Solutions for all phases of the product life cycle

Regardless of the stage of the product development life cycle (R&D, qualification, or manufacturing) JDSU test solutions and product options can meet your cost and performance requirements. This capability extends to providing software drivers or full software applications that ensure quick and efficient integration of JDSU test solutions.

Committed to international standards compliance

International measurement standards compliance is critical to assuring customers of the validity of the test methodology employed. JDSU actively participates in the development and maintenance of the international standards which govern passive component testing (most notably IEC and TIA). Our products are aligned and reference the key standards to which they comply.

History of innovation and performance

JDSU continues to deliver on its history of innovation. Products including the Swept Wavelength System revolutionized DWDM testing. The ability to integrate leading JDSU fiber optics switches enables delivery of unmatched performance while providing cost-effective scalability for manufacturing.

Support Excellence

Application and service experts around the world are available to assist with implementation and service needs.

Selection Guide

MAP Insertion Loss/Return Loss Meter

The mORL-A1 is a powerful, compact Insertion Loss (IL) and Optical Return Loss (ORL) meter for use with the JDSU advanced MAP-200 platform. One, single-slot module contains up to 4 sources (1310, 1490, 1550, 1625 nm), integrated power meter, and an optional 2x2 optical switch for automated bidirectional testing.

The MAP-200 is compatible with the following microscope probes: the FVD-2200, FVD-2400, and P-5000. All three of which are also compatible with the standard PC-based FiberCheck2™. The auto-focus series (FVA) and other probes work directly with standard PC-based FiberCheck2, but are not available for the MAP.

Compact Photonic Tools/c-Series Testers

The c-Series testers provide general purpose, high-performance solutions for new labs and new engineers entering the industry. The c-Series offer an attractive entry-level suite for small- and medium-sized connector and patch cord manufacturers.

OCETS Plus and EasyOCETS

OCETS Plus addresses the latest requirements for optical component qualification testing, including the industry's first repeatable return loss measurements up to 70 dB.

Swept Wavelength System

The SWS2000 series is the industry-standard solution for measuring IL, polarization dependent loss (PDL), RL, and directivity with high wavelength resolution.

Absolute wavelength accuracy over 1520 to 1630 nm range is ±0.002 nm, high sweep speed 40 nm/s and >70 dB dynamic range.
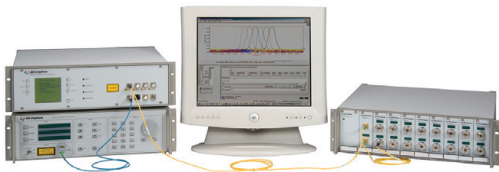
Accessories

JDSU offers various measurement accessories: detector adaptors, jumpers, and integrating spheres.

Fiber Inspection

The FiberChek2 fiber connector end face analysis program removes operator influence from the inspection process, resulting in a truly objective certification of fiber end face quality. This program operates with both high-resolution benchtop inspection tools, such as the FVD and FVA platforms, and the P5000 probe microscope, capable of inspecting connectors mounted behind a bulkhead or panel.

Services

JDSU technical support, included with every product purchase, is available at 800 406-9559 (North America), 800 4069-5599 (Outside North America), and 10 800 140 5599 (China), and via support@jdsu.com.

MAP Insertion Loss/Return Loss Meter
(mORL-A1 with PCT Automation Software)

Key Features

- Mandrel-free optical return loss measurements on fiber-optic patch-cords as short as 70 cm with 80 dB dynamic range

- Fast, compact solution with 1310, 1490, 1550 and 1625 nm laser and automated bidirectional option in a single slot

- Measures ORL on terminated bulkheads

- Ultra high IL measurement accuracy with display resolution of ±0.001 dB

- Flexible turn-key software platform for manufacturing testing

- Quick measure mode for R&D users

- 12 and 24 fiber MT ready with optical switch and integrating sphere option

Applications

- Testing of optical connectors, patch-cords and cables in R&D and Manufacturing

- Verification of connector return loss on line cards and receptacle based transponders

Safety Information

- The MAP Insertion Loss / Return Loss meter when installed in a MAP chassis, complies with CE, CSA/UL/IEC61010-1, plus LXI Class C requirements.

The mORL-A1 is a powerful, compact Insertion Loss and Optical Return Loss meter for use with the JDSU advanced MAP-200 platform. One, single-slot module contains up to 4 sources (1310, 1490, 1550, 1625 nm), integrated power meter and an optional 2x2 optical switch for automated bidirectional testing.

Building on the success of the JDSU RX3000 meter, the mORL-A1 optical return loss measurement is based on time domain technology—often referred to as "mandrel-free." Mandrel-free technology dramatically reduces test time by relieving the users from making slow, difficult, manual terminations during both the set-up and execution of return loss measurements.

The mORL-A1 has been designed to exceed the measurement performance provided by our industry-standard RX3000 with 80 dB of return loss dynamic range, insertion loss display resolution of 0.001 dB, and measurement times as low as 6 s for two wavelengths. In addition, the mandrel-free technology also enables the length of the patch cord to be measured.

The PCT (Passive Component and Connector Test) Application software provides two unique interfaces for R&D and manufacturing and combines the mORL-A1 with all the necessary peripherals to speed and simplify workflow.

Figure 1: mORL with PCT software solution

PCT Application Environment

PCT (Passive Component and Connector Test) is the application environment for the mORL-A1 module. It is a MAP-200 "Super-Application" as it not only drives the mORL module but several adjacent modules and peripherals (optical switches, bar code reader, and USB printers) to create a total application solution. The PCT software has two main operation modes: Instrument mode and Script mode.

Instrument mode gives users quick and easy access to all the key setup parameters in a simple easy to use intuitive graphical user interface (GUI). This is ideal for the R&D or the Qualification Lab environment where users want maximum control in a rapidly changing environment. At all times, users have access to interactive windows that show the current connection view and measurement setup. Quick save features allow users to save test results to text files and window settings to simplify recall.
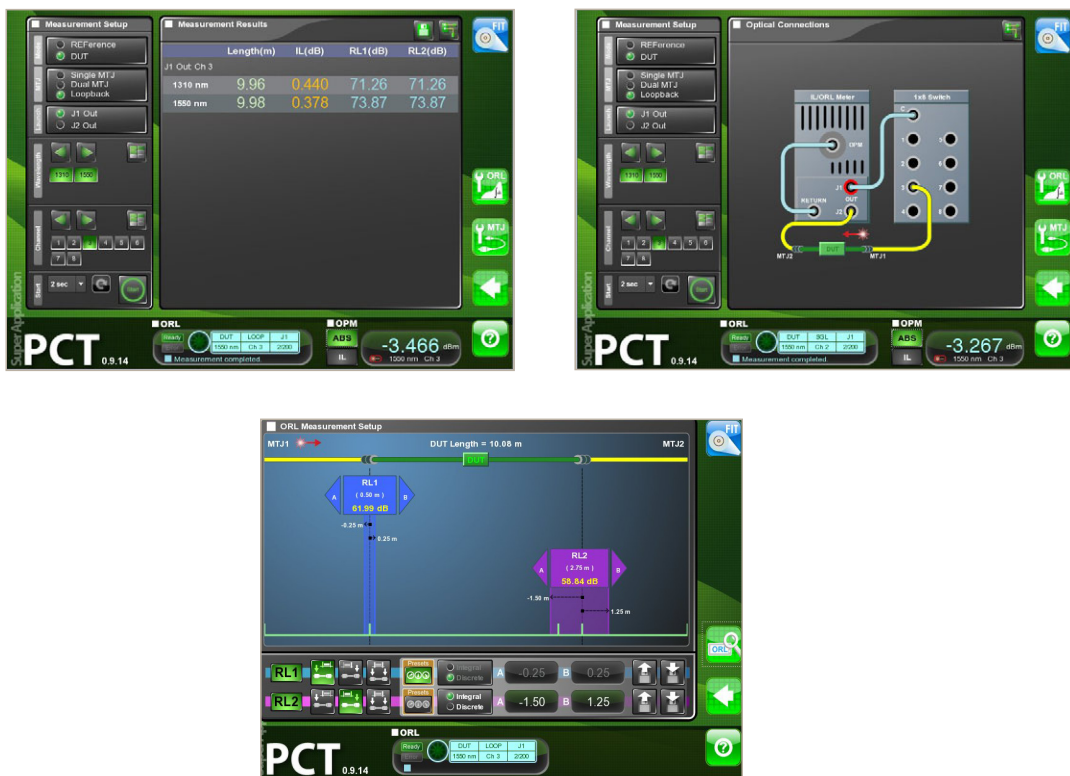

Figure 2: Instrument mode - Basic View, Connection View, and RL Window Setup

Script mode provides a fully automated test environment with user-programmed test sequences, and a SQL-Light database for results storage all in a password-protected environment. User-defined scripts ensure that production procedures are followed strictly while a full HTML editor can be used to embed instructions and photos for operators to follow. From the database, reports and labels may be printed or data exported for analysis. A database query engine allows users to extract results based on criteria such as device type, connector type, or customer. Trends can be used to implement statistical process controls and monitor operator efficiency.
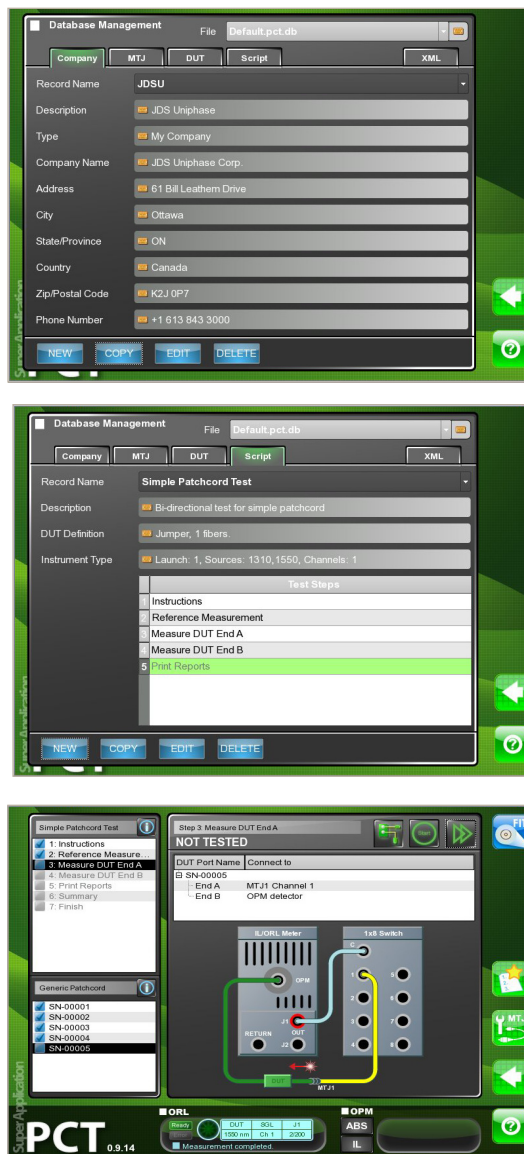

Figure 3: Script mode - Database Setup, Serial Number Program, and Script Execution

External Automation

For integration with external automation environments, the PCT Application leverages the full power of the MAP-200 platform. It has a full set of SCPI-based commands accessible through the local area network (LAN) or over the legacy General Purpose Interface Bus (GPIB) interface. The simple, robust, remote interface has been designed as a core requirement of the application. The MAP-200 Linux-based operating system removes the need to maintain legacy Windows-based platforms and reduces work for IT departments on virus and network access.

Optical Switches

Multi-channel implementations are easily created by pairing with the industry leading MAP Large Channel Count (mLCS-A1) switch family. Switches are used to speed workflow and allow multiple master test jumpers (MTJ) to be connected to the system at one time. This enables several potential time saving modes:

- Batch testing of single-fiber patch cords

- Allows for the presence of various connector types at a workstation requiring multiple connector types and hybrid devices

- Fast, efficient testing of ribbon fibers or break-out cables.

The JDSU mLCS-A1 large compact switch family is the industry leader in loss and repeatability and is capable of providing over 10M+ switch cycles without specification degradation. The repeatability and stability of the switch directly impacts the repeatability of the insertion loss measurement.
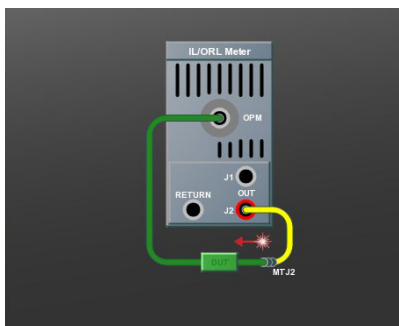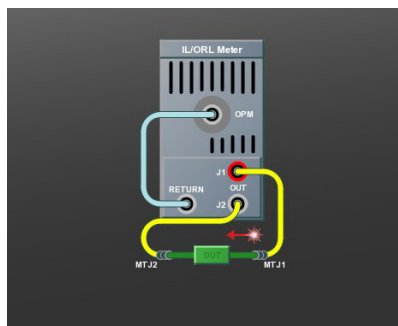

Figure 4: Single Ended - Single MTJ

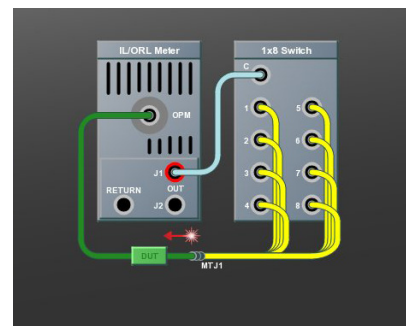Figure 5: Automated Bidirectional
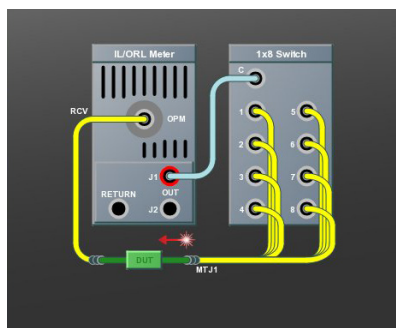

Figure 6: Multi-fiber with 1XN switch

Figure 7: Multi-fiber with 1XN switch and receive fiber

Integrating Sphere and Ribbon Fiber Testing

An optional integrating sphere attachment is available and is intended for ribbon connector and bare fiber measurements. The integrating sphere scatters the input light to create uniform illumination on its inner surface. A small opening at the photodiode allows the optical power level to be measured. The innovative JDSU design allows customers to order the integrating sphere as an option, and remove it for maintenance. The input aperture is large enough to work with 72 fiber MT ferrules when used with the correct detector adaptor.
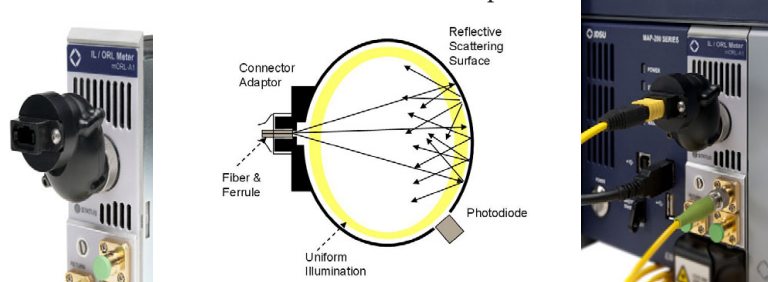
Workflow Enhancement Options

The PCT Application supports a number of workflow enhancements through several USB peripherals, the most critical of which are the JDSU Fiber Inspection Microscopes such as the FVD Benchtop Microscope and P5000-Series probes. Use these supported microscopes with the PCT Application to ensure that all connector end faces are clean prior to test and, critically, prior to customer shipments. The PCT supports USB barcode readers, printers, and label printers and simplifies data entry and report or label generation.

The BDR option adds an internal 2x2 switch, which when coupled with the time domain RL measurement can dramatically reduce test times by measuring the optical return loss of both connectors with one jumper connection. This is accomplished using the multiple programmable window function. This removes the need to measure the jumper in the other direction, effectively cutting the measurement time by 50%.

Figure 8: Example using the JDSU FVD to verify the connector end face of the jumper under test

Field Serviceability

For manufacturing applications, keeping equipment maintained with minimum downtime is critical to profitability. The mORL-A1 module and the MAP-200 are focussed on this need. An industry-unique feature for modular platforms is the access the mORL provides to the optical connectors. As shown below, removing one easy screw provides full access to the bulkhead connector for cleaning and re-polishing.

Figure 9: Quick plate removal

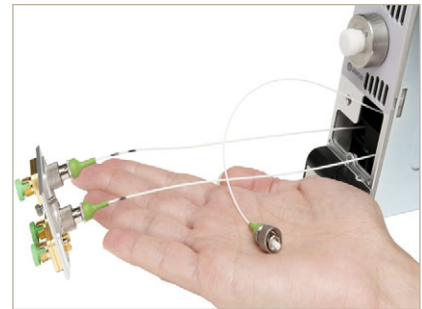Figure 10: Fiber pay-out and management system

Figure 11: Full access to connector with length to polish

Specifications

Parameter	
Wavelengths	
Wavelengths: 2-wavelength version	1310, 1550 nm
4-wavelength version	1310, 1490, 1550, 1625 nm
Measurement Time	
Initialization time	< 4 s
Averaging time options per wavelength	< 2, 5, 10 s
Insertion Loss	
Display resolution	0.001 dB
Total IL uncertainty[1]	±0.02 dB
Additional uncertainties	
Due to 1xN switching (if mLCS-A1 added)	±0.01 dB
Due to fiber position in Integrating Sphere[3]	±0.03 dB
Return Loss	
Display resolution	0.01 dB
DUT length – DUT reflections (both ends) < 40 dB	> 170 cm
DUT reflections (both ends) > 40 dB	> 70 cm
Measurement modes[2]	
Repeatability	
– 30 to 65 dB	±0.1 dB
–65 to 70 dB	±0.2 dB
–70 to 75 dB	±0.4 dB
– 75 to 80 dB	±1.5 dB
Accuracy	
– 30 to 70 dB	±1.0 dB
–70 to 75 dB	±1.7 dB
– 75 to 80 dB	±3.0 dB

Environmental	
Parameter	
Warm-up time	20 min
Operating temperature, humidity	25 ±5℃, non-condensing humidity
Storage temperature range	−30 to +60℃

Physical	
Parameter	
Size (W x H x D)	4.06 x 13.26 x 37.03 cm (1.6 x 5.22 x 14.58 in)
Weight (approximate)	1.2 kg (2.65 lb)
Recalibration Period	1 year

1. Total expanded uncertainty (2σ) same connector being reconnected using internal source
2. All measurement specifications provided at 5 s averaging time unless otherwise stated
3. 24-channel ribbon fiber

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

Product Code	Description
MORL-A13500-MSTD	IL/RL Meter, Standard dual wavelength (1310, 1550 nm)
MORL-A13500-MBID	IL/RL Meter, Integrated bidirectional, dual wavelength (1310, 1550 nm)
MORL-A13456-MSTD	IL/RL Meter, Standard quad wavelength (1310, 1490, 1550, 1625 nm)
MORL-A13456-MBID	IL/RL Meter, Integrated bidirectional, quad wavelength (1310, 1490, 1550, 1625 nm)

Fiber Type Options (Required)

M100	9/125 fiber type

Connector Options (Required)

MFA	FC/APC connector type

Optional mLCS-A1

Product Code	Description
MLCS-A1104B	Single 1 x 4 switch, bulkheads
MLCS-A1108B	Single 1 x 8 switch, bulkheads
MLCS-A2112B	Single 1 x 12 switch, bulkheads (dual width)
MLCS-A2124B	Single 1 x 24 switch, bulkheads (dual width)

Fiber Type Options (Required)

M100	9/125 fiber type

Connector Options (Required)

MFA	FC/APC connector type

Optional Integrating Sphere[1]

Product Code	Description
AC990	72 Fiber Integrating Sphere, locking style

1. For additional mainframe information refer to Multiple Application Platform MAP-200 data sheet.

Compact Photonic Tools
Optical Return Loss Meter (cORL-A1)

Key features

- Provides versatility with optical power, return loss, and light source in single unit
- Operates at four key FTTx wavelengths (1310, 1490, 1550, and 1625 nm)
- Combines two or three laser versions on a single output
- Dynamic range of 70 dB for return loss measurements

Applications

- Serves as a general purpose lab tool
- Performs return loss testing of FTTx and passive optical components
- Performs return loss testing of optical connectors and cables
- Monitors back reflection during alignment process

The JDSU Compact Photonic Tools offer a new portfolio of point solutions for fiber optic test applications. The cORL-A1 provides a compact, intuitive Optical Return Loss Meter designed to enable applications ranging from simple continuity verification and return loss testing to integration into process automation equipment designed for automated alignment.

Available in two or three laser versions with the option to select from four key wavelengths: 1310, 1490, 1550, and 1625 nm. The intregrated multiplexer and single optical output found in the cORL-A1 greatly simplifies the optical connections and calibrations. The 70 dB dynamic range in return loss enables the measurement of high performance angled physical contact (APC) connectors.

A simple, intuitive graphical user interface (GUI) and keypad minimizes training requirements. A universal serial bus (USB) interface may be used for test automation interfacing to a PC. While connected by USB, the cORL-A1 does not require an additional mains connection, reducing cord tangle.

Three Units for the Price of One

The cORL-A1 is actually three units in one. Through the use of the mode key, the unit will operate as a simple fiber-coupled optical power mode (OPM) or as a simple Fabry-Perot Light Source. Full standard commands for programmable instruments (SCPI) for these other modes are supported.

Innovative Features Reduce Test Duration by 3X When Paired with a cOPM-A1

TWIN or TRIPLE Test

Enabling TWIN or TRIPLE test features on the cOPM-A1 dramatically lowers test durations by allowing simultaneous measurement of two or three wavelengths. Accessing this features requires pairing a cOPM-A1 with the cORL-A1. When this feature is enabled on both units, the cOPM-A1 will automatically detect the wavelengths present and display the simultaneous measured output power (or loss) for each. Additionally, with these two units paired together, simultaneous insertion loss and return loss may be measured. Pairing the cORL with the cOPM created the functionality of the historic JDSU RM Series or single-channel RX Series.

Specifications

Parameter	cORL-A1
ORL Mode	
Peak wavelength	1310, 1490, 1550, 1625 nm
Wavelength accuracy	± 20 nm
Fiber type	SMF-28
Wavelength settings	780 to 1600 nm, step size 1 nm
Spectral width	<5 nm
Return loss range	
Single wavelength	0 to 70 dB
Multi wavelength	0 to 50 dB
Resolution	0.01 dB
Return loss accuracy	± 0.7 dB (0 to 50 dB)
	± 0.9 dB (50 to 60 dB)
FPL Mode	
Maximum output power	0 dBm
Attenuation range	7 dB
Attenuation resolution	0.01 dB
Modulation	CW, 270 Hz, 1 kHz, 2 kHz
Stability	± 0.02 dB (15 min)/ ± 0.2 dB (8 hr)
OPM Mode	
Wavelength range	1260 to 1650 nm
Power range	−70 to +6 dBm
Display resolution	0.01 dB/0.001 µW
Fiber type	SMF
Uncertainity at reference condition[1]	± 0.4 dB

General

Connector type	Interchangeable APC adapters (SC, FC, LC, ST, DIN)
Recalibration period	1 year
Warm-up time	5 min
Operating temperature	−10 to +55℃
Humidity	Non-condensing
Dimensions (W x H x D)	250 x 88 x 210 mm (9.84 x 3.46 x 8.27 in)
Weight	1.8 kg (4 lbs)
Remote interface	USB (through virtual com port driver)
Powering options	Auto sensing
Mains	100 to 240 V AC, 50 to 60 Hz
USB	Direct from USB, no main required
Power consumption[2]	1.1 W

1. Reference condition: −20 dBm (CW), 1310 ±1 nm, 23 ±3°C, to 75% RH, 9 µm

2. When connected to the AC power plug

Ordering Information

Product Code	Description
BN 2298/21	DualWavelength Optical Return Loss Meter – 1310, 1550 nm
BN 2298/22	TripleWavelength Optical Return Loss Meter – 1310, 1490, 1550 nm
BN 2298/23	TripleWavelength Optical Return Loss Meter – 1310, 1550, 1625 nm

All versions come with universal APC adpaters from 215x/00.xx range.

Compact Photonic Tools
Fabry-Perot Laser (cFPL-A1)

Key Features

- **Provides four keys FTTx wavelengths (1310, 1490, 1550, and 1625 nm)**
- **Combines two or three lasers onto a single output**
- **Adjustable output power**
- **Selectable continuous wave or modulated output power**

Applications

- Serves as a basic light source for laboratory use
- Performs insertion loss testing of passive optical components
- Performs insertion loss testing of optical connectors and cables
- Provides light sources for automated alignment stations

The JDSU Compact Photonic Tools offer a new portfolio of point solutions for fiber optic test applications.

The cFPL-A1 provides a compact, intuitive laser source designed to enable applications ranging from simple continuity verification and insertion loss testing to integration into process automation equipment designed for alignment.

Available in two or three laser versions with the option to select from four key wavelengths: 1310, 1490, 1550, and 1625 nm. The integrated multiplexer and single optical output found in the cFPL greatly simplifies the optical connections and calibrations. To compensate for downstram wavelength-dependent loss, each wavelength can be individually controlled and attenuated up to 7 dB with 0.01 dB resolution.

A simple, intuitive graphical user interface (GUI) and keypad minimizes training requirements. A universal serial bus (USB) interface may be used for test automation interfacing to a PC.

Innovative Features Reduce Test Duration by 3x When Paired with a cOPM-A1

TWIN or TRIPLE Test

Enabling TWIN or TRIPLE test features on the cFPL dramatically lowers test durations by allowing simultaneous measurement of two or three wavelengths. Accessing this feature requires pairing of a cOPM-A1 with the cFPL-A1. When this feature is enabled on both units, the cOPM-A1 will automatically detect the wavelengths present and display the simultaneously measured output power (or loss) for each.

Specifications

Parameter	cFPL-A1
Peak wavelength	1310, 1490, 1550, 1625 nm
Wavelength accuracy	±20 nm
Fiber type	SMF-28
Spectral width	<5 nm
Maximum output power	0 dBm
Attenuation range	7 dB
Attenuation resolution	0.01 dB
Modulation	CW, 270 Hz, 1 kHz, 2 kHz
Stability	±0.02 dB (15 min)±0.2 dB (8 hr)
Connector type	Interchangeable adapters (SC, FC, LC, ST, DIN)
Recalibration period	1 year
Warm-up time	5 min
Operating temperature	−10 to +55℃
Humidity	Non-condensing
Dimensions (W x H x D)	250 x 88 x 210 mm (9.84 x 3.46 x 8.27 in)
Weight	1.8 kg (4 lbs)
Remote interface	USB (through virtual com port driver)
Powering options	Auto sensing
Mains	100 to 240 V AC, 50 to 60 Hz
USB	Direct from USB, no main required
Power consumption[1]	1.1 W

1. When connected to the AC power plug

Ordering Information

Product Code	Description
BN 2299/01	Dual Wavelength Fabry-Perot Source, 1310,1490 nm
BN 2299/02	Dual Wavelength Fabry-Perot Source, 1310,1550 nm
BN 2299/03	Dual Wavelength Fabry-Perot Source, 1310,1625 nm
BN 2299/04	Dual Wavelength Fabry-Perot Source, 1490,1550 nm
BN 2299/05	Dual Wavelength Fabry-Perot Source, 1490,1625 nm
BN 2299/06	Dual Wavelength Fabry-Perot Source, 1550,1625 nm
BN 2299/07	Triple Wavelength Fabry-Perot Source, 1310,1490,1550 nm
BN 2299/08	Triple Wavelength Fabry-Perot Source, 1310,1490,1625 nm
BN 2299/09	Triple Wavelength Fabry-Perot Source, 1310,1550,1625 nm
BN 2299/10	Triple Wavelength Fabry-Perot Source, 1490,1550,1625 nm
BN 2299/21	Dual Wavelength Fabry-Perot Source, 1310,1490 nm
BN 2299/22	Dual Wavelength Fabry-Perot Source, 1310,1550 nm
BN 2299/23	Dual Wavelength Fabry-Perot Source, 1310,1625 nm
BN 2299/24	Dual Wavelength Fabry-Perot Source, 1490,1550 nm
BN 2299/25	Dual Wavelength Fabry-Perot Source, 1490,1625 nm
BN 2299/26	Dual Wavelength Fabry-Perot Source, 1550,1625 nm
BN 2299/27	Triple Wavelength Fabry-Perot Source, 1310,1490,1550 nm
BN 2299/28	Triple Wavelength Fabry-Perot Source, 1310,1490,1625 nm
BN 2299/29	Triple Wavelength Fabry-Perot Source, 1310,1550,1625 nm
BN 2299/30	Triple Wavelength Fabry-Perot Source, 1490,1550,1625 nm

All versions come with universal adapters from BN 215x/00.xx range.

Compact Photonic Tools
Optical Power Meter (cOPM-A1)

Key features
- Operates over wide wavelength range (800 to 1650 nm)
- High power capability option can withstand up to 2W
- Low PDL <0.01 dB
- Bare fiber measurement capability
- SCPI-compliant commands over USB automation interface
- Auto dark current measurements

Applications
- Serves as a basic tool for performing laboratory absolute optical power measurements
- Performs insertion loss testing of passive optical components
- Performs insertion loss testing of connectors and cables
- Performs optical powermeasurements in automated alignment stations

The JDSU Compact Photonic Tools offer a new portfolio of point solutions for fiber optic test applications. The cOPM-A1 Optical Power Meter is optimized for a number of applications ranging from general lab use to test and process automation for passive optical components. It can be used with both single-mode and multimode fiber and offers power levels from −80 to +15 dBm over a wavelength range of 800 to 1650 nm. The cOPM-A1 features high accuracy, high linearity, and extremely low polarization-dependent sensitivity.

Similar to the JDSU Multiple Application Platform (MAP-200), the cOPM-A1 detector heads use the AC100 interchangeable detector adapters that are available for most common connector types, as well as a fiber holder that permits bare fiber measurements. The cOPM-A1 Indium-Gallium-Arsenide (InGaAs) Optical Power Meter has a FC connector detector adapter as a standard accessory and an optional integrating sphere, which may be fastened to the front panel for increased power measurements to 33 dBm (2 W) with decreased polarization dependent loss (PDL) to 0.005 dB.

A simple, intuitive graphical user interface (GUI) and keypad minimizes training requirements. A universal serial bus (USB) interface may be used for test automation using a PC. While connected by USB, the cOPM-A1 does not require an additional mains connection, reducing cord tangle.

Innovative Features Reduce Test Duration by 3X
The following two powerful features enable the cOPM-A1 to dramatically reduce test duration in manufacturing and minimize potential operator errors.

Auto Dark Current
The cOPM-A1 removes the need for manual dark current measurements through innovative analog circuit design. Typical power meters must be routinely and manually terminated to measure residual current from the photodiode. If this termination is not performed, or performed poorly, significant errors can result for low power measurements. The cOPM-A1 automatically conducts these measurements in the background, which results in zero downtime for a test station and simplifies daily start-up procedures.

TWIN or TRIPLE Test
For Insertion Loss and Return Loss measurements, TWIN or TRIPLE tests dramatically lower test durations up to three times by allowing for the simultaneous measurement of two or three wavelengths. To enable TRIPLE Test, the cOPM-A1 is paired with either the cFPL-A1 Fabry-Perot Light Source or the cORL-A1 Optical Return Loss Meter. For additional information, refer to the cORL and cFPL data sheets.

Specifications

Parameter	cOPM-A1
Sensor element	InGaAs
Wavelength range	800 to 1650 nm
Power range	−80 to +15 dBm
Display resolution	0.01 dB/0.001 μW
Fibre type	SMF and MMF with N/A <0.27
Maximum core diameter	62.5 μm
Uncertainty at reference condition[1]	±3%
Linearity at reference condition[1]	±0.06 dB, ±20 pW
Averaging time	200 μs
Recalibration period	1 yr
Warm-up time	5 min
Operating temperature	−10 to +55°C
Humidity	Non-condensing
Dimensions (W x H x D)	250 x 88 x 210 mm
	(9.84 x 3.46 x 8.27 in)
Weight	1.8 kg (4 lbs)
Remote interface	USB (through virtual com port driver)
Powering options	Auto sensing
Mains	100 to 240 V AC, 50 to 60 Hz
USB	Direct from USB, no main required
Power consumption[2]	1.1 W

1. Reference condition: −20 dBm (CW), 1310 ±1 nm,
   23 ±3°C, to 75% RH, 9 to 50 μm
2. When connected to the AC power plug

Integrating Sphere

Parameter	AC330
Attenuation at reference[1]	−30.7 ±0.8 dB
Spectral range	800 to 1650 nm
Wavelength flatness[2]	<±1.5 dB
RL[3]	>65 dB (typical)
Relative uncertainty[4]	<±0.05 dB
Residual polarization dependent loss (PDL)[5]	<0.005 dB
Maximum power[6]	+33 dBm (2 W)
Operating temperature	10 to 40°C, RH 15 to 70%
Storage temperature	−30 to 60°C, RH 15 to 95% non-condensing

1. Measured with wavelength of 1550 nm at 23 ±5°C and RH = 50% with straight connector
2. From 850 to 1650 nm, refer to the wavelength of 1310 nm
3. Measured at 1310 and 1550 nm with SM fiber and FC/APC connector
4. At reference condition, with 8 degree angled connector, due to the polarization and interference
5. Measured at 1550 nm
6. Continuous Wave (CW) laser

Ordering Information

Product Code	Description
Base	
BN2297/02	Power meter with InGaAs Diode
Optional Accessories	
3 mm InGaAs MAP Power Meter	
AC100	Detector cap
AC101	FC detector adapter
AC102	ST detector adapter
AC103	SC detector adapter
AC112	MT ribbon cable adapter
AC114	MU detector adapter
AC115	E2000 detector adapter
AC120	Magnetic fiber holder (requires AC121)
AC121	Single bare fiber plug (requires AC120)
AC330	+33 dBm integrating sphere

Compact Photonic Tools
LED Source (cLED-A1)

Key Features

- Provides two key datacom wavelengths (850 and 1300 nm)
- Combines two LEDs on a single output
- Includes adjustable output power
- Offers selectable continuous-wave or modulated output power

Applications

- Serves as a basic light source for laboratory use
- Performs insertion loss testing of passive optical components
- Performs insertion loss testing of optical connectors and cables
- Provides light sources for automated alignment stations

The JDSU Compact Photonic Tools offer a new portfolio of point solutions for fiber optic test applications.

The cLED-A1 provides a compact, intuitive light emitting diode (LED) source designed to enable applications ranging from simple continuity verification and insertion loss testing to integration into process-automation equipment designed for alignment.

The integrated multiplexer and single optical output found in the cLED greatly simplifies the optical connections and calibrations. To compensate for downstream wavelength-dependent loss, each wavelength can be individually controlled and attenuated up to 7 dB with 0.01 dB resolution.

A simple, intuitive graphical user interface (GUI) and keypad minimizes training requirements. A universal serial bus (USB) interface may be used for test automation interfacing to a PC.

Innovative Features Reduce Test Duration by 2x When Paired with a cOPM-A1

TWIN Test

Enabling TWIN test features on the cLED dramatically reduces test durations by allowing the simultaneous measurement of two wavelengths. Accessing this feature requires pairing of a cOPM-A1 with the cLED-A1. When this feature is enabled on both units, the cOPM-A1 will automatically detect the wavelengths present and display the simultaneously measured output power (or loss) for each.

Specifications

Parameter	cLED-A1
Peak wavelength	850, 1300 nm
Center wavelength accuracy	±20 nm
Fiber type	50 µm MMF
Spectral width	<20 nm
Maximum output power	−23 dBm
Attenuation range	7 dB
Attenuation resolution	0.01 dB
Modulation	CW, 270 Hz, 1 kHz, 2 kHz
Stability	±0.02 dB (15 min.)±0.2 dB (8 hrs.)
Connector type	Interchangeable adapters (SC, FC, LC, ST, DIN)
Recalibration period	1 year
Warm-up time	5 min.
Operating temperature	−10 to 55℃
Humidity	Non-condensing
Dimensions (W x H x D)	250 x 88 x 210 mm (9.84 x 3.46 x 8.27 in.)
Weight	1.8 kg (4 lbs)
Remote interface	USB (through virtual COM port driver)
Powering options	Auto sensing
Mains	100 to 240 V AC, 50 to 60 Hz
USB	Direct from USB, no main required
Power consumption[*]	1.1 W

[*] When connected to the AC power plug.

Ordering Information

Product Code	Description
BN 2299/46	Dual Wavelength LED Source, 850, 1300 nm

Comes with universal adapters from BN 215x/00.xx range.

Optical Component Environmental Test System
OCETS Plus Series

Key Features

- High Return Loss option (HiRL) monitors RL up to 70 dB
- Up to 210 device channels (420 ports)
- High insertion loss (IL) and return loss (RL) repeatability
- Full bidirectional testing
- Single-mode and multimode systems
- Supplied with EasyOCETS Software

OCETS Plus is the evolution of the classic OCETS system that has been shipping from JDSU for over a decade. The classic OCETS hardware specifications and software algorithms have been improved to meet the latest market requirements for optical component qualification testing, such as those driven by Verizon's FOC program.

At the core of OCETS Plus is a pair of custom grade JDSU SC Series programmable switches (1xN configuration). OCETS switches are specified to higher levels of IL repeatability and background RL than JDSU analog grade SC switches. Therefore, the implementation of an OCETS Plus system represents an improvement over the capability of any in-house system that utilizes analog grade SC switches.

In addition to the SC switches, OCETS Plus is a hardware platform that comprises Fabry-Perot lasers, a source switch, directional switches, a polarization controller, high directivity couplers, and a power meter. A typical OCETS Plus hardware configuration is illustrated as Figure 1.

Applications

- Unattended long term monitoring of optical component IL, PDL, and RL
- Measures parameters required in Telcordia standards such as GR-326-CORE, GR-910-CORE, GR-1435-CORE, GR-1209-CORE and GR-2866-CORE
- Verizon FOC qualification for components such as Jumpers, Cables, and Passive Splitters

Safety Information

- Complies to CE requirements. Switch and MAP based products comply to UL3101.1 and CAN/CSA-C22.2 No. 1010.1. MAP lasers are Class 1 except for 850 nm version which is Class 1M. The lasers are classified per IEC standard 60825-1(2002) and comply with 21CFR1040.10 except deviations per Laser Notice No. 50, July 2001

INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 1M LASER PRODUCT
(IEC 60825-1, 2002)
700-1400 NM

CLASS 1 LASER PRODUCT
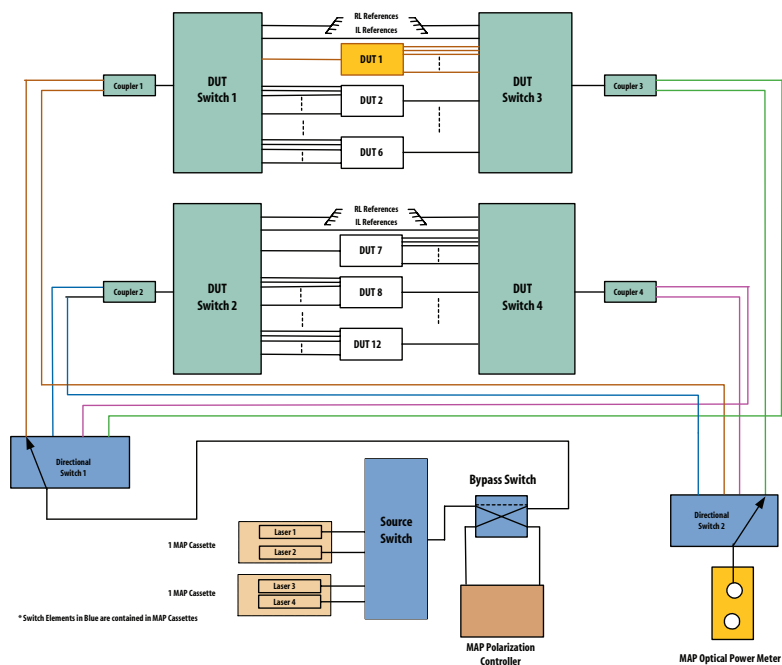(IEC 60825-1, 2002)

Figure 1   Bidirectional Test Configuration of 1x32 splitters, within a 210 channel (420 port) system

About Environmental Testing

In order to be incorporated into modules and transmission systems, fiber optic component manufacturers must show that their devices meet the relevant standards for performance and reliability. Standards vary between industries, but some element of testing over an extended temperature and humidity range is required.

All standards require that a representative number of samples of the device be subjected to a program of environmental stresses. The stress types include dwelling at high and low temperatures, while maintaining target humidity levels and cycling between temperatures. An environmental test program might consist of numerous temperature and humidity pairings. The device characteristics are required to be measured before and after each stage, and in some cases continuously or at intervals during the stage. Removing all the devices from the environmental chamber for optical measurements is simply not practical. It is this measurement requirement for which the OCETS Plus environmental test system has been designed.

OCETS Plus Details

The largest specification improvement made to the OCETS platform is the ability to monitor RL changes up to 70 dB when the HiRL option is chosen. Classic OCETS was specified to 65 dB, and was a limiting factor for test labs and manufacturers attempting to certify FC/APC connectors to a return loss level of 65 dB. Besides the 70 dB measurement capability, OCETS Plus is capable of delivering 210 user-channels (420 test ports) to enable environmental tests involving twelve 1x32 splitters can be monitored bidirectionally, with an additional 5% channels available as reference spares.

OCETS Plus Base Packages

Single-mode systems are available in 55, 105, 160 or 210 channel counts, with either FC/APC or No Connectors selected as the interconnect choice from the large SC switches to the devices under test (DUTs).

Multi-mode systems are available in 55 or 105 channel counts, with FC/APC connectors only, but with the extra option of having either 50 μm or 62.5 μm core fiber specified.

OCETS Plus Source Option

The Source option is the only option that must be added to the Base Package. For single-mode applications, users can choose from either a two-wavelength system (1310/1550 nm) or a four-wavelength system (1310/1490/1550/1625 nm). For multi-mode systems, only a two-wavelength option is available (850/1300 nm).

Additional OCETS Plus Options

Single-mode systems have two options: HiRL and PDL. The HiRL option enables users to monitor RL up to 70 dB (for low loss devices). Ordering this option results in modifications to both the software and hardware when compared to the standard OCETS Plus. The HiRL software driver is provided on an additional CD, separate to EasyOCETS, and the SC switches are validated to higher levels of RL than in a standard grade system. The PDL option does not need to be ordered at the time of initial purchase, but if this option is ordered later then JDSU Global Service and Support must install and validate system performance on-site. HiRL systems must be ordered without connectors (NC). The channel count on the base package and HiRL number must be the same.

Multi-mode systems are not provided with HiRL or PDL modes, and therefore have only the 850/1300 nm Source option.

About EasyOCETS

EasyOCETS software is a comprehensive update to the classic OCETS software. EasyOCETS resolves the test-set up time problem at customer sites by introducing an intuitive graphical user interface (GUI) that expedites setting up test configurations, measurement paths, test scheduling, and data viewing. The time required to set up test configurations and measurement cases has been reduced from hours to minutes. Lab staff may focus on the measurement results, rather than maintaining the test system itself.

A personal computer pre-installed with EasyOCETS software is supplied with a system purchase. The HiRL driver is also supplied on a separate CD if those options are purchased.

EasyOCETS Software
– Windows XP and Windows 7 compatible

– Drag and drop style graphical user interface (GUI)

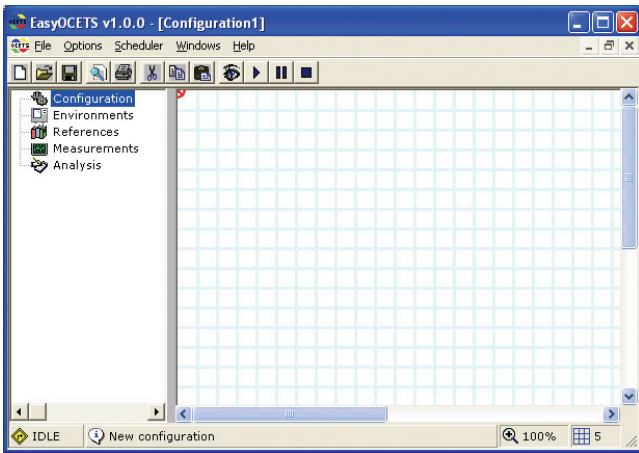– Environmental chamber control

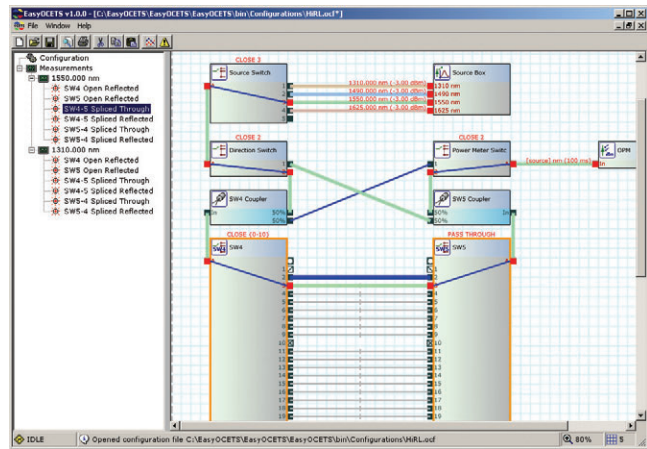

Figure 2   EasyOCETS main menu and configuration palette

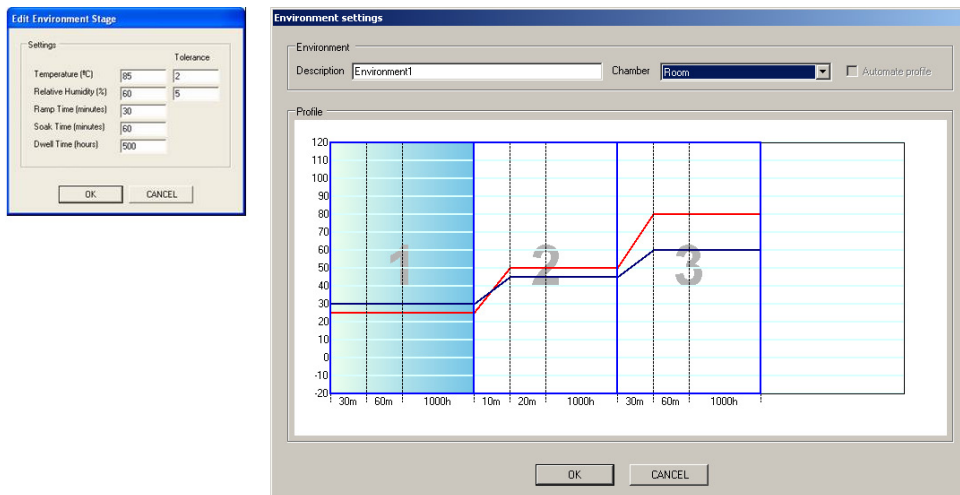

Figure 3   Setting up measurement cases

Figure 4   EasyOCETS Chamber Control Interface and Profile Screen

OCETS Plus Specifications

Parameter	Single-mode (SM)	Multimode (MM)
Fiber Type	9/125 mm fiber, standard 3 mm jacket	50/125 mm or 62.5/125 mm fiber, standard 3 mm jacket
SC Switch Pigtail Lengths (to DUTs)	5 m	5 m
Insertion Loss (IL) dynamic range	>65 dB	>50 dB
Insertion Loss (IL) repeatability over 100 hours	±0.04 dB for IL <50 dB	±0.04 dB for IL <35 dB
Return Loss dynamic range	>70 dB	>30 dB
Return Loss (RL) repeatability over 100 hours	±0.5 dB up to 55 dB With HiRL option: ±1 dB up to 65 dB ±3 dB up to 70 dB	±0.5 dB up to 30 dB
Polarization Dependent Loss (PDL) repeatability over 100 hours	±0.08 dB with fusion splices joining DUT switches	N/A
Measurement Timing	IL, RL, HiRL <2.5 s[1] PDL < 10 s	IL, RL <2 s
Sources Available[2, 3]	1310, 1490, 1550, 1625 ±10 nm Fabry-Perot Lasers	850, 1300 ±20 nm LED[4]
Source Power Stability at 23°C[5]	±0.01 dB for 20 minutes	±0.01 dB for 15 minutes

General

Number of Channels	Up to 210 input, and 210 output (420 channel ports)
Number of Reference Channels[6]	1 IL path, 1 RL path (per DUT switch)
Equipment Warm-Up Time	4 hours, can be left on indefinitely with no adverse side effects
Input Voltage	220V AC, 50 Hz and 100V AC, 60 Hz
Power Consumption (includes computer)	55 to 160 channels: 750 VA 210 channels: 950 VA
Computer Control	PC Supplied, National Instruments GPIB controller board installed 17 inch monitor (minimum), EasyOCETS software installed Data file format compatible with MS-Excel The computer is to be located a maximum distance of 5 m from the equipment rack
Mechanical Configuration	All equipment, except computer, is installed in a single bay 32U 19 inch rack with removable covers and door Cabinet includes top-mounted fans, casters and levelers W x H x D: 22 x 72 x 36 in Rear door access to MAP cassettes
Weight	55 to 160 channels: 190 kg 210 channels: 220 kg
Operating Humidity	0 to 80% RH range. Maximum variation range during a test: 15% RH
Operating Temperature	15 to 30°C range. Maximum variation within range during a test: 3°C

1. Averaged over 60 consecutive measurements, not including reference or saving to database.
2. Measured immediately after calibration.
3. Specifications in this Table are guaranteed specifically for the sources listed. On a custom basis, the OCETS Plus platform is capable of supporting up to 22 lasers (dual cassettes, specifications may change).
4. Multimode launch conditions meet the requirements of IEC 61280-4-1 Ed2.
5. The number of channels(55 for example) means 55 input and 55 output.
6. The RL reference as utilized in the EasyOCETS software algorithms is a 0 dB reflector. Users may add RL references to other ports. . In addition, as many input and output ports as required for IL references can be utilized by the user.

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

OCETSPLUSxxx+1yzz	
Channels	
Code xxx	*Number of Channels*
055	055
105	105
160	160
210	210
Fiber Type	
Code y	*Fiber Type (μm)*
7	9/125
1	50/125
2	62.5/125
Connector	
Code zz	*Connector Type*
FA	FC/APC (Not available for HiRL option)
NC	No connector

Options	
Product Code	**Description**
HiRL (Single mode only)	
HiRL 55	High Return Loss option (70 dB) for 55 channel system
HiRL 105	High Return Loss option (70 dB) for 105 channel system
HiRL 160	High Return Loss option (70 dB) for 160 channel system
HiRL 210	High Return Loss option (70 dB) for 210 channel system
PDL (Single mode only)	
OCETSPLUS PDL	PDL Polarization Dependant Loss option
Source	
OCETSPLUS SM 2 SOURCE	OCETS Single-mode Source 1310/1550 nm
OCETSPLUS SM 4 SOURCE	OCETS Single-mode Source 1310/1550/1490/1625 nm
OCETSPLUS MM 2 SOURCE	OCETS Multimode Source 850/1300 nm

Ordering Software Separately

EasyOCETS can be purchased separately to upgrade a classic OCETS system purchased between 2003 and 2007. The ordering code is 21099423 and has the description "EasyOCETS application software". (EasyOCETS is included within the purchase of any OCETS Plus Base Package so there is no need to specify this item separately during a new system purchase).

HiRL drivers are available to customers who purchased classic OCETS systems with the Ultra-High RL option over the same time frame (2003-2007).

All software is licensed for single-station usage.

Swept Wavelength System
SWS2000 Series

Key Features
- Scalable architecture—add more stations any time
- ±0.002 nm absolute wavelength accuracy
- Up to 128 detector channels available per station
- Remote source laser can be shared by up to 8 workstations
- High speed scanning (user controllable) up to 40 nm/s
- Flexible easy-to-use software
- Customized applications through dynamic link libraries (DLLs)
- 24/7 service and support

Applications
- Optical component and module characterization in both R&D and manufacturing environments
  - ROADMs, Wavelength Switches, Wavelength Blockers
  - Circuit Packs
  - Dense wavelength division multiplexing (DWDM)
  - Tunable Filters, Couplers, Splitters, Switches, Attenuators, Fiber Bragg Gratings (FBGs), Interleavers, Dichroic Filters
  - Micro-Electro-Mechanical Systems (MEMS) and Waveguide Devices
  - Complies with IEC 61300-3-29, IEC 61300-3-12

Safety Information
- Complies to CE requirements plus UL3101.1 and CAN/CSA - C22.2 No. 1010.1. The laser source in the Source Optics Module (SWS20010) is a class 1. The Tunable Laser Source (SWS17101) is a class 3B laser. Both are classified per IEC standard 60825-1(2002) and comply with 21CFR1040.10 except deviations per Laser Notice No. 50, July 2001.

The Swept Wavelength System SWS2000 series remains the industry standard solution for measuring insertion loss (IL), polarization dependent loss (PDL), return loss (RL) and directivity with high wavelength resolution in both research and development (R&D) and production environments. Currently used at more than 80 customer sites, with over 8500 detector channels deployed, the SWS test platform validates optical performance for the latest in optical components and modules including: ROADMs, Wavelength Switches, Tunable Filters and Circuit Packs. The SWS system consists of a tunable laser source, a source optics module (SOM), a control module, a receiver chassis, one or more detector modules and application software.

With a ±0.002 nm absolute wavelength accuracy over the entire 1520 to 1630 nm range, a high sweep speed of 40 nm/s, and a deep dynamic range of >70 dB, the SWS2000 provides excellent performance combined with a low cost of ownership; the distributed architecture supports up to eight separate, individually controlled measurement stations per source laser. Often purchased initially as an R&D tool, this scalability in the number of measurement stations provides customers the flexibility to transition the equipment from R&D to production.

Upgrade packages from legacy SWS systems to the SWS2000 platform are available to ensure that existing SWS users receive the maximum benefit from their existing capital infrastructure.

CLASS 1M LASER PRODUCT
(IEC 60825-1 / 2001)

CLASS 1 LASER PRODUCT
(IEC 60825-1, 2002)

SWS directly measures IL, PDL and average loss as a function of wavelength. RL is measured with the optional RL modules (SWS20005). Using the raw IL and PDL data, the application software provides a comprehensive set of analysis tools that calculate:

- Loss at peak
- Center wavelength, from x dB threshold
- Loss at center wavelength
- Bandwidth at x dB threshold
- Crosstalk, left/right and cummulative
- Flatness

These parameters are calculated relative to the measured peak, ITU grid, or user-defined grid.

The SWS is delivered with a set of DLLs that can be used to develop software to suit custom testing requirements. The DLLs function through the SWS receiver hardware, allowing access to all SWS functionality. Using the supplied DLLs, applications may be developed in Visual Basic™, C, C++, or LabView environments.

With a 4-State polarization controller located within the SOM, PDL and average loss are measured quickly as a function of wavelength. Four polarization states at 0°, 90°, −45° and circular polarization are measured, and the Mueller matrix analysis is used to accurately determine PDL at all wavelengths scanned.

When the very highest accuracy PDL measurements are required, a special version of the detector module should be used. The SWS15107-A contains specially selected and tuned components to allow PDL measurement to an accuracy of better than ±0.01 dB. This module is supplied with a fixed FC/APC connector.

All specifications listed are met simultaneously. No change in wavelength accuracy (±2 pm) or scan speed (20 nm/s) is required to obtain a 70 dB dynamic range.

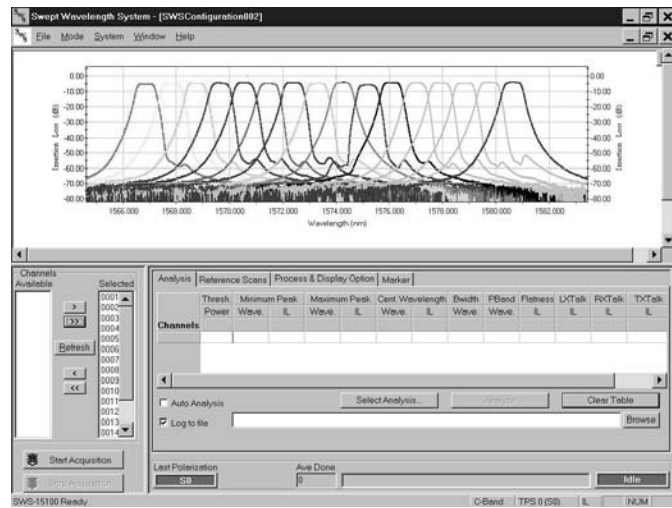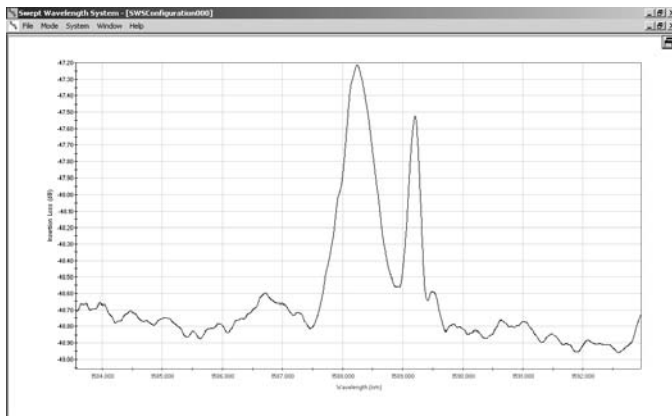**Typical Application of SWS2000**
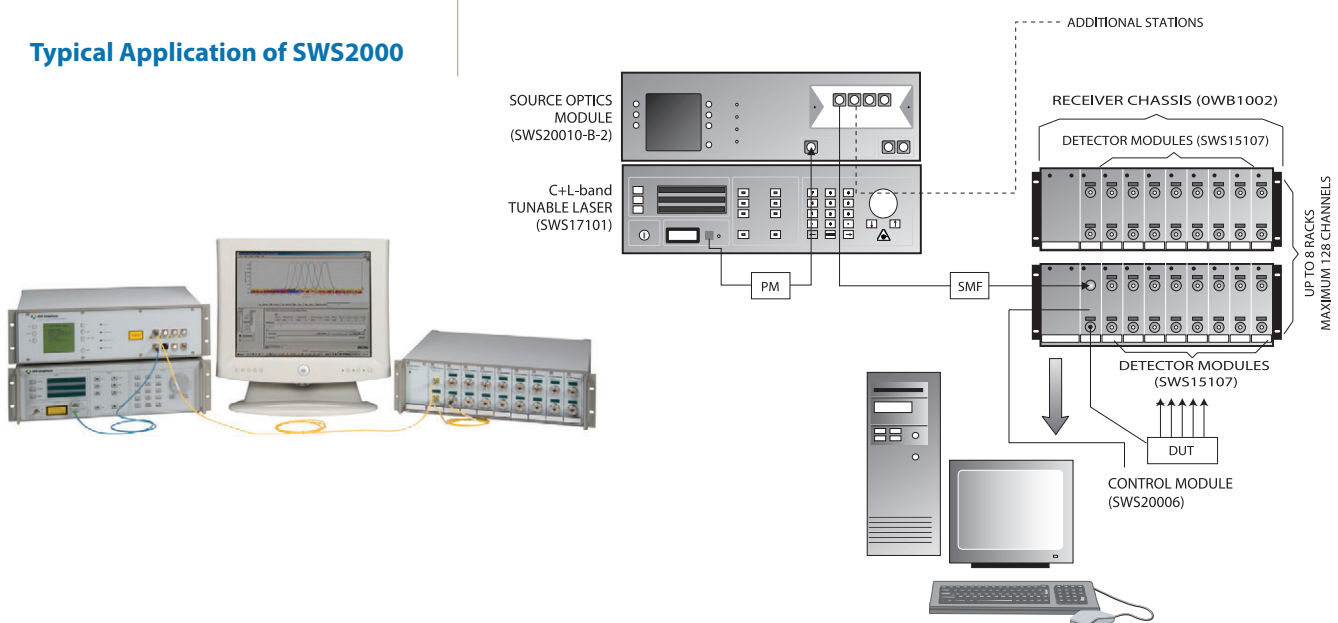
Analysis Setup Window
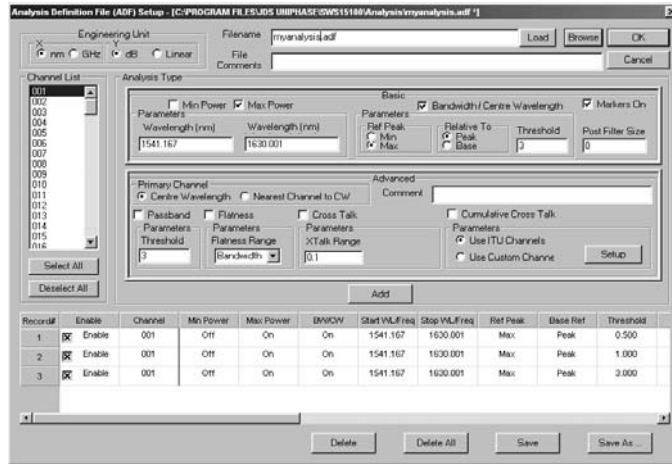
Data Display and Control Window

RL Measurement with SWS2000

SWS2000 Specifications

Parameter	Single Output Source Optics Module
Wavelength range	C+L-band 1520 to 1630 nm
Absolute wavelength accuracy	±2 pm
Measurement resolution[1]	1 pm
Wavelength sampling resolution	3 pm
Insertion loss (IL) measurement accuracy including polarization state averaged IL[2, 3]	±0.05 dB (0 to 25 dB device IL) ±0.10 dB (25 to 45 dB device IL), ± 0.20 dB (45 to 65 dB device IL)
Dynamic range[3]	>70 dB
Loss measurement repeatability[2, 3, 4]	±0.02 dB
Loss measurement resolution	0.01 dB
Return loss (RL) measurement range[3, 5]	60 dB
Polarization dependent loss (PDL) measurement accuracy using standard detector module SWS15107[2]	±0.05 dB (0 to 20 dB device IL) ±0.10 dB (20 to 40 dB device IL)
PDL measurement accuracy with 13-point smoothing and 4 averages[2]	±0.01 dB (0 to 20 dB device IL) ±0.03 dB (20 to 40 dB device IL)
PDL measurement repeatability[2, 3, 4]	±0.01 dB
PDL measurement resolution[1]	0.01 dB
Maximum slope resolution	10 dB/pm (0 to 35 dB device IL)
Measurement time	9 s ±0.5 s per channel
Maximum scan speed[6, 7]	40 nm/s
Fiber type (to device-under-test)	SMF-28
Maximum outputs from device under test (DUT) measured	128
Measurement stations per transmitter	Up to 8, in 1, 2, 4, or 8 steps
Detector adapters	FC, SC, ST, LC, bare fiber
Input voltage	110 to 230 V AC , 50 to 60 Hz
Receiver control	Custom interface for Windows 95/98/2000/XP
Receiver communication with computer	National Instruments™ PCI interface card
Operating temperature	15 to 30°C
Storage temperature	0 to 70°C
Operating humidity	80% RH maximum, non-condensing
Dimensions (W x H x D)	
Source optics module(SOM) (SWS20010-B-2)	48.3 x 13.3 x 37.5 cm
Tunable laser source (SWS17101)	48.3 x 13.3 x 43.2 cm
Receiver chassis (OWB10002)	48.3 x 13.3 x 46.0 cm
Control and detector modules	Plugged into chassis

1. Wavelength resolution defined as the minimum calculated center wavelength shift.
2. Does not include influence of connector.
3. Device IL range/dynamic range both reduced for multiple output SOM.
4. Measurement repeatability conditions:
   a. Polarization state averaged insertion loss.
   b. Loss less than 20 dB.
   c. Measurement performed within 15 minutes of taking reference.
   d. Measurement performed within ±3 °C
5. RL module SWS20005 required.
6. 10 and 20 nm/s also selectable.
7. All other specifications are maintained when using a scan speed of 20 nm/s.

Ordering Information

SWS2000 Core System

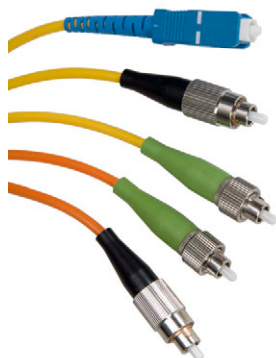| Product Code	Description
SWS17101	C+L-band Tunable Laser
SWS20010-B-2	Dual output integrated source optic module (SOM)
SWS20010-B-4	Four output integrated source optic module (SOM)
SWS20010-B-8	Eight output integrated source optic module (SOM)
SWS20006-B	All-band control module: PCI kit included
OWB10002	Receiver chassis
SWS15107	All-band detector module

SWS2000 Optional Equipment and Accessories

Product Code	Description
SWS20004	PCI Interconnect card and cable kit
SWS20005	Return loss (RL) cassette (single channel)
AC100	Detector cap
AC101	FC detector adapter
AC102	ST detector adapter
AC103	SC detector adapter
AC118	LC detector adapter
AC120	Magnetic detector adapter
AC121	Bare fiber holder (requires AC120)

Power Cords (Required)

Product Code	Description
CORD-AU	Australia/China power cord
CORD-EU	European power cord
CORD-JP	Japan power cord
CORD-UK	United Kingdom power cord
CORD-US	United States power cord

Adapters and Calibrated Jumpers

AC Adapters are for use with the JDSU power meters from the MAP, c-Series, SWS, OCETS, and legacy product lines.

The AC900 series are new precision adapters with a locking feature for better measurement precision that can be used with the mOPM-B1, mORL-A1, and all c-Series. For compatibility questions, or if you need an adaptor not listed, contact the Technical Assistance Center (TAC) support.

Measurement Accessories

AC100 Series

Product Code	Description
AC100	Detector cap
AC101	FC adapter
AC102	ST adapter
AC103	SC adapter
AC104	D4 adapter
AC108	Diamond HMS-0
AC112	MT (ribbon connector)
AC113	Ribbon fiber holder (requires AC120)
AC114	MU
AC115	E2000
AC116	FC, ST, SC universal adapter
AC117	MPO/MTP
AC118	LC
AC119	MT-RJ
AC120	Adapter holder (for AC121 and AC113)
AC121	Bare fiber holder (requires AC120)

AC900 Series

Product Code	Description
AC900	Magnetic quick cap
AC901	FC adapter
AC903	SC adapter
AC917	MPO adapter
AC918	LC adapter

Power Cords (Required)

Product Code	Description
CORD-AU	Australia/China power cord
CORD-EU	European power cord
CORD-JP	Japan power cord
CORD-UK	United Kingdom power cord
CORD-US	United States power cord

Calibrated Hybrid Jumper

Product Code	Fiber Type	WL Range (µm)
CH200-07-FAFP	50/125, FAFP	0.8, 1.3
CH200-A9-FAFP	9/125, FAFP	1.3, 1.5
CH200-17-FAFP	62.5/125, FAFP	0.8, 1.3

Additional Accessories

UCAs (Universal Connector Adapters– Mating Sleeves)

Product Code	Description
AC500	FC/PC to FC/PC
AC501	FC/PC to SC/PC
AC502	FC/APC to FC/APC
AC503	FC/APC to SC/APC

Integrating Spheres

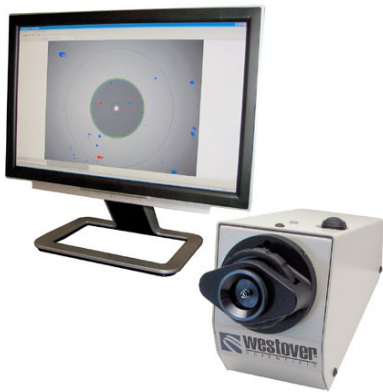| Product Code	Description
AC330	33 dBm integrating sphere for high power and single fiber
AC990	Multi-fiber integrating sphere

FVD Benchtop Microscope & FiberChek2™
Benchtop Microscope & Automated Inspection & Analysis Software

PC / display not included.

Key features

- FiberChek2 software pre-programmed to comply with International Electrotechnical Commission (IEC) acceptance criteria standards for single-mode and multimode connectors

- Implements standards for inspection and grading throughout every stage of fiber handling

- Ensures consistent results by removing human subjectivity from fiber inspection and grading

- Identifies and characterizes each defect and contamination particle, and determines their location relative to the fiber core

- Archives results and images as HTML or PDF formats and generates integrated reports

- Plugs directly into PC/laptop via USB 2.0 connection

Applications

- Inspect and analyze patch cords and jumper cables in manufacturing and quality assurance environments

- Automatically capture and analyze fiber end face images, and obtain a PASS/FAIL result according to preconfigured criteria

- Standardize fiber inspection and analysis process

FVD Benchtop Microscope and FiberChek2

The FVD-series digital fiber microscope is used to inspect the polished surface or cleaved ends of fiber optic connectors. This high-resolution benchtop inspection microscope is ideally suited for post-polish inspection of high-quality end faces and can repeatedly detect scratches that may be missed by human technicians, delivering the level of sensitivity long sought in the industry. The FVD requires a connector adapter and PC to supply power to the unit through the USB 2.0 port.
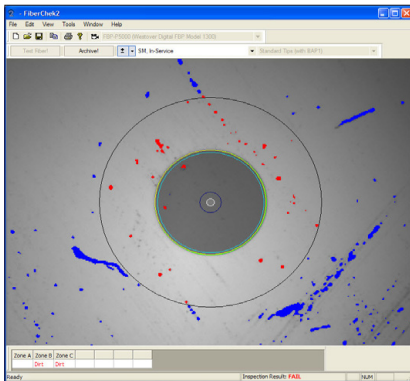
FiberChek2 is an advanced application that determines the acceptability of optical fiber end faces through automated inspection and analysis. It identifies and characterizes defects and contamination and determines their location relative to the fiber core. It then provides a PASS or FAIL result according to a pre-configured failure criteria setting. It is an intuitive, effective, and practical solution for fiber end face grading and inspection.

Inspect Before You Connect℠

INSPECT → **IS IT CLEAN** ?

CLEAN ← NO / YES → **CONNECT**
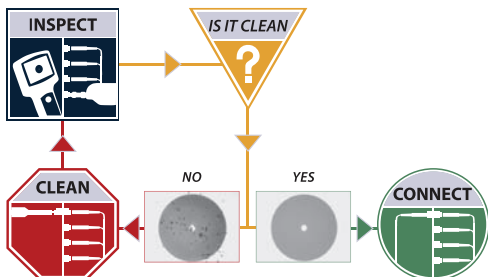
Contamination is the number 1 reason for troubleshooting optical networks. Proactive inspection and cleaning of fiber connectors can prevent poor signal performance, equipment damage, and network downtime.
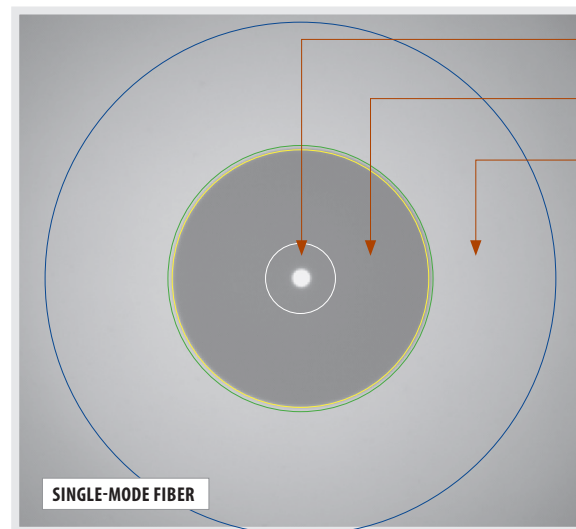
QuickCapture™ Button
Instantly captures and analyzes fiber image

Focus Head

FMA Adapter
2.5 mm adapter

USB 2.0 Connection

FiberChek2 User Interface

As different types of contamination are located and identified, FiberChek2 measures the size of each feature, determines its location relative to the core, and analyzes the collected data using an advanced logarithm to obtain a Pass or Fail result based on parameters configured for each predefined setting.

Because defects and contamination on or near the core surface typically affect the light transmission most significantly, they require the most aggressive examination. FiberChek2 defines the concentric areas around the core as zones which let users establish failure criteria by evaluating various defect categories, including contamination, pit/chip and scratches.

Note: Zones are a series of concentric circles that identify areas of interest on the connector end face. The inner-most zones are more sensitive to contamination than the outer zones.
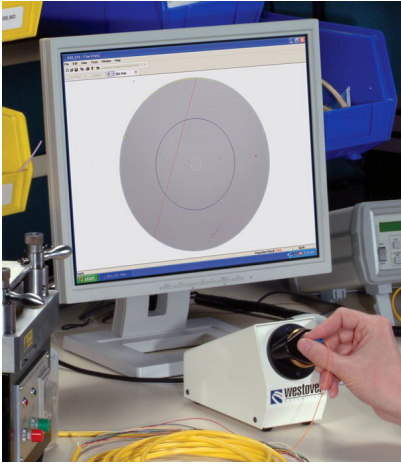

FiberChek2 HTML Summary Report

A **CORE** Zone

B **CLADDING** Zone

C **FERRULE/CONTACT** Zone

Benefits

- Eliminate human subjectivity for consistent, standardized results when inspecting and grading fiber

- Configurability allows for user-defined Pass/Fail criteria settings

- Standardizes of inspection, analysis, and grading process throughout fiber networks

- Record and archive results in HTML or PDF formats

FiberChek2 Automated Procedures

1. Acquires the fiber image

2. Analyzes the image

3. Finds defects and their location to fiber core

4. Measures and evaluates the defects within each specified zone

5. Determines whether defects within the zones are acceptable according to the pre-configured failure criteria for each zone

6. Displays the results as Pass or Fail

7. Saves or prints all relative results in designated directory or printer, respectively

FVD Benchtop Specifications

Dimensions	17.8 x 7.9 x 11.7 cm (7.0 x 3.1 x 4.6 in)
Weight	1.36 kg (3.0 lbs)
Live image	800 x 600; 15 fps
Connector	USB 2.0
Cord length	183 cm (6 ft)
Camera sensor	1280 x 1024 black and white, 1/3-in (1.27 cm) CMOS
Particle size detection	< 0.5 µm
Light source	Blue LED, 100,000+ hour life
Lighting technique	Coaxial
Power source	USB port
Certification	CE
Warranty	1 yr

Field of View Values (µm)

	High-mag	Low-mag
FVD-2080	Horizontal: 1060	Horizontal: 1710
	Vertical: 800	Vertical: 1280
	Diagonal: 1325	Diagonal: 2135
FVD-2200	Horizontal: 400	Horizontal: 640
	Vertical: 300	Vertical: 480
	Diagonal: 500	Diagonal: 800
FVD-2400	Horizontal: 185	Horizontal: 300
	Vertical: 140	Vertical: 225
	Diagonal: 230	Diagonal: 375
FVD-2400-L	Horizontal: 200	Horizontal: 325
	Vertical: 150	Vertical: 245
	Diagonal: 250	Diagonal: 400

Ordering Information

Product Code	Description
FVD-2080	Digital fiber inspection benchtop microscope (80X); USB 2.0; FiberChek2 software; FMA adapter: universal 2.5 mm connectors
FVD-2200	Digital fiber inspection benchtop microscope (200X); USB 2.0; FiberChek2 software; FMA adapter: universal 2.5 mm connectors
FVD-2400	Digital fiber inspection benchtop microscope (400X); USB 2.0; FiberChek2 software; FMA adapter: universal 2.5 mm connectors
FVD-2400-L*	Digital fiber inspection long working distance (LWD) benchtop microscope (400X); USB 2.0; FiberChek2 software; FMA adapter: universal 2.5 mm connectors

*Select FVD-2400-L when inspecting multi-fiber, or ribbon, connectors with guide pins.

CleanBlast™ System—Benchtop
Advanced Fiber Optic Connector End Face Cleaning System

CleanBlast System—Benchtop
with Optional FBP Probe Microscope

Key features

- Provides rapid, controlled, and repeatable cleaning and removal of contamination from fiber end faces

- Uses a precise non-contact air-solvent-air mixture/sequence to blast and remove contamination particles

- Cleans faster, more effectively, and more economically per clean than conventional methods

- Offers a comprehensive selection of precision cleaning tips and adapters

- Input for FBP probe microscope and 6.4-inch LCD display for fiber inspection capability

Applications

- Clean various types of both *male* (patch cord) and *female* (bulkhead) connector ends, including SC, FC, LC, ST, E2000, MPO, MTP®, MPX, MT, and SMA

- Quickly and easily remove contamination, dust, lint, oil, and other forms of debris from fiber optic end faces

- Clean multiple configurations and connector types with interchangeable precision cleaning tips and adapters

CleanBlast System

The patented JDSU CleanBlast fiber end face cleaning systems provide a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications. CleanBlast is a non-contact system that uses a highly filtered stream of pressurized gas with a vacuum circuit to create a high flow rate jet across the surface of the fiber. A 30 µl cleaning solvent is injected into the airflow, and the contamination from the end face along with the solvent are then removed through the retrieval circuit. **The precise, highly efficient non-contact *air-solvent-air* stream blasts and removes contamination with nearly 100-percent effectiveness.**
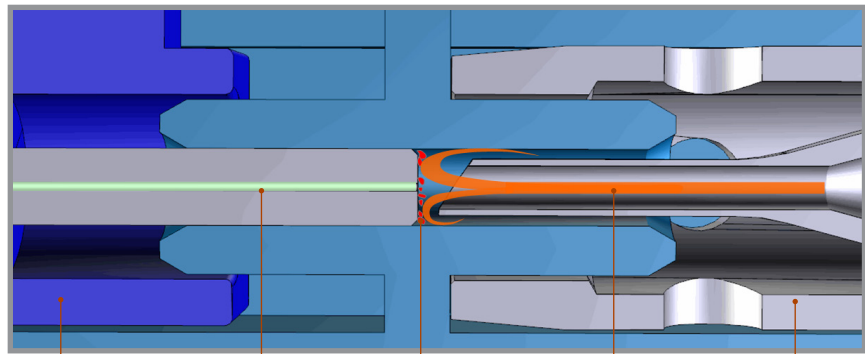
Connector Body   Fiber   Contamination   Air-Solvent-Air Stream   Cleaning Tip

Non-Contact Cleaning Illustration

Benefits

- Fast, repeatable, more effective, and more cost-efficient per clean than other cleaning methods

- Eliminates user sensitivity and error

- Removes, rather than spreading or smearing, loose debris from fiber end faces with a push of a button

- Input for FBP probe microscope and 6.4-inch LCD enable fiber inspection capability

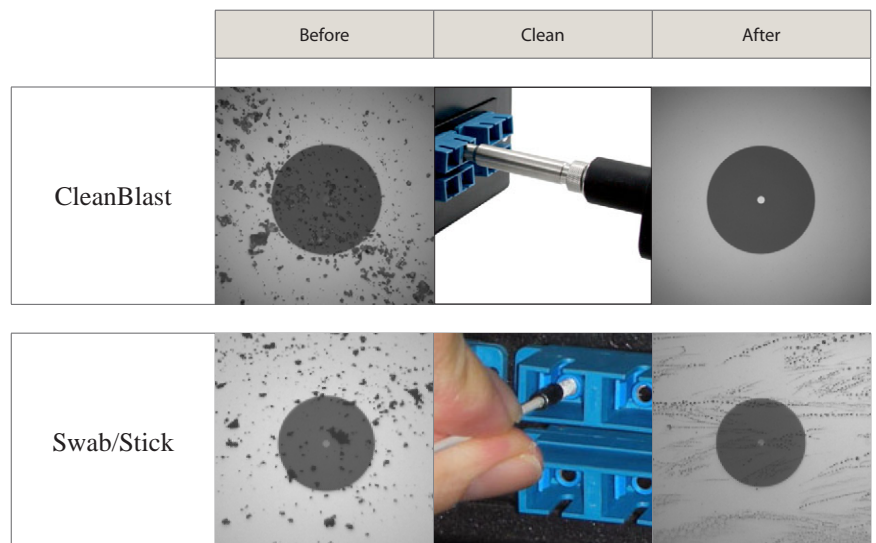- Optional USB 1.1 output enables operation with basic FiberChek fiber analysis software

FCLT Cleaning Tips

JDSU offers a complete selection of precision cleaning tips and adapters for every connector and application, including SC, FC, ST, LC, MU, E2000, and MPO/MTP connectors.

Overview

The JDSU Benchtop CleanBlast systems include a base unit and a handset connected to a 5-ft umbilical for reaching various application areas. Precision cleaning tips are available for both male (patch cord) and female (bulkhead) connectors for various connector types, including SC, LC, FC, ST, E2000, MPO, MPX, MT, and SMA. All models include an input port for a separate probe microscope for fiber inspection capabilities, and a video output for connecting to an external monitor or to a mounted liquid crystal display (LCD). Digital systems feature an additional universal serial bus (USB) output for viewing the fiber image on a PC/laptop.

The system's cleaning solvent reservoir holds enough solution for at least 8,000 cleaning cycles. The solvent refill process is simple and spill-resistant. A built-in safety feature prevents the handset from accidentally triggering the system. It also monitors solvent levels and the safety switch, and it features a series of light emitting diodes (LEDs) to indicate system status.

Bulkhead Cleaning	Patch Cord Cleaning

	Before	Clean	After
CleanBlast			
Swab/Stick			

CleanBlast vs. Traditional Swab/Stick

Handset

Cleaning Tip   **Run Button**

Air Filter Compartment

Release Screws for Case

Release Lever for Air Filter Compartment

Cleaning Solvent Refill

System Status LED Indicators

Handheld Handset w/ 5-ft Umbilical

FBP Probe Microscope
(optional)

Components and Functions

CleanBlast System—Benchtop with Optional Transceiver Module

CleanBlast—Benchtop Specifications

Dimensions	40 x 33 x 18 cm (16 x 13 x 7 in)
Weight	9.5 kg (21 lbs)
Power requirements	100–240VAC, 2Amp
Air source	External or nitrogen, regulated output 40 psi.
Solvent consumption	At least 8,000 cleaning cycles per refill
Maintenance	100,000 cycles per air filter change, 2 x 0.01 micron air filters required
Video output	NTSC (BNC) or DIN connector to optional LCD
Digital output	Optional USB 1.1 output (includes USB cable and FiberChek software)
Cleaning cycle time	1 second

Ordering Information

Product Code	Description
FCL-B1000	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B1000-22	CleanBlast–benchtop with 22-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B1000-EU	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip; EU power supply
FCL-B1000-UK	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip; UK power supply
FCL-B1100	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; universal 2.5 mm cleaning tip
FCL-B1100-EU	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; universal 2.5 mm cleaning tip; EU power supply
FCL-B1100-UK	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; universal 2.5 mm cleaning tip; UK power supply
FCL-B2000	CleanBlast–benchtop with 5-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2000-22	CleanBlast–benchtop with 22-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2100	CleanBlast–benchtop with 5-ft umbilical 90-degree bulkhead handset; USB 1.1 output; universal 2.5 mm cleaning tip
FCL-B2100-EU	CleanBlast–benchtop with 5-ft umbilical 90-degree bulkhead handset; USB 1.1 output; universal 2.5 mm cleaning tip; EU power supply
FCL-B3000	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm bulkhead cleaning tip and patch cord adapter
FCL-B4000	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm patch cord adapter
FCL-B4000-EU	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; universal 2.5 mm patch cord adapter; EU power supply
FCL-B4100	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; universal 2.5 mm patch cord adapter
FCL-B4100-EU	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; universal 2.5 mm patch cord adapter; EU power supply
FCL-B5000	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; transceiver module; FBP-P5 probe microscope
FCL-B5100	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; transceiver module; FBP-P505 probe microscope
FCL-B5100-EU	CleanBlast–benchtop with 5-ft umbilical bulkhead handset; USB 1.1 output; transceiver module; FBP-P505 probe microscope; EU power supply
FCL-B6000	CleanBlast–benchtop with backplane cleaning wand
FCL-B6100	CleanBlast–benchtop with backplane cleaning wand; USB 1.1 output

FVA Benchtop Microscope with FiberChek2™

Fully Automated Bench-top Microscope with Fiber Analysis Software
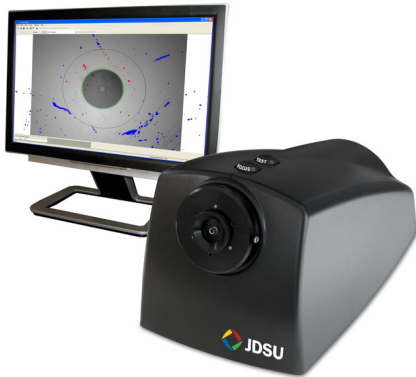
FVA Benchtop Microscope with FiberChek2

Key features

- Fully automated inspection system:
  - Quickly and consistently focuses and centers fiber end face
  - Locates and counts defects and scratches
  - Evaluates against Pass/Fail criteria
- Adjustable, scalable automation settings from all-manual to all-automated
- Archives results and images in HTML or PDF formats and generates integrated reports
- Plugs directly into PC via USB 2.0 connection
- FiberChek2 pre-programmed with International Electrotechnical Commission (IEC) acceptance criteria standards for single-mode and multimode connectors

Applications

- Automatically inspects and analyzes fiber optic connectors in manufacturing and quality assurance environments
- Automatically focuses, centers, captures, and analyzes fiber end face images, and obtains instant Pass or Fail result
- Standardizes fiber inspection and analysis procedures

Benefits

- Eliminate subjectivity from inspection with a fully automated repeatable system for fiber inspection
- Significantly reduce total inspection time by removing the need to focus the fiber manually
- Document that your product is compliant with end face quality standards, such as IEC-61300-3-35
- Easily define and enforce your Pass/Fail criteria

Fully Automated FVA Benchtop Microscope

The new FVA digital fiber microscope is a unique device that fully automates the inspection process, significantly reducing inspection time and simplifying workflow. The FVA microscope is used to inspect the polished surface of fiber optic connectors, and its high-resolution results are ideally suited for post-polish inspection of high quality end faces. It also detects scratches that technicians may miss, delivering the level of sensitivity long sought in the industry. The FVA is powered by a 12V adapter (included) and a PC via USB 2.0.

FiberChek2 is an advanced application that determines the acceptability of optical fiber end faces through automated inspection and analysis. It identifies and characterizes defects and contamination and determines their location relative to the fiber core. It then provides a Pass or Fail result according to a preconfigured failure criteria setting.
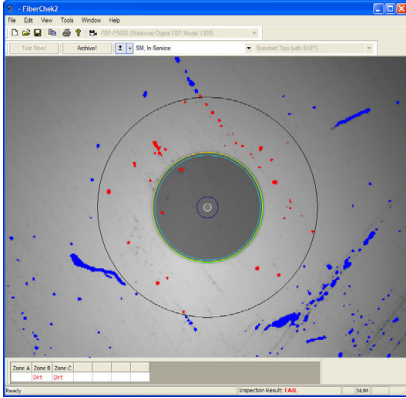
FiberChek2 User Interface

FiberChek2 Software

As different types of defects are located and identified, FiberChek2 measures the size of each feature, determines its location relative to the core, and analyzes the collected data to obtain a Pass or Fail result based on parameters configured for each predefined setting.

Because defects and contamination on or near the core surface typically affect the light transmission most significantly, they require the most aggressive examination. FiberChek2 defines the concentric areas around the core as zones, which let users establish failure criteria by evaluating various defect categories, including contamination, pit/chip, and scratches.

Note: Zones are a series of concentric circles that identify areas of interest on the connector end face. The inner-most zones are more sensitive to contamination than the outer zones.

Field-of-view Values (µm)

|	High-mag	Low-mag
FVA-2080	Horizontal: 1060	Horizontal: 1710
	Vertical: 800	Vertical: 1280
	Diagonal: 1325	Diagonal: 2135
FVA-2200	Horizontal: 400	Horizontal: 640
	Vertical: 300	Vertical: 480
	Diagonal: 500	Diagonal: 800
FVA-2400	Horizontal: 185	Horizontal: 300
	Vertical: 140	Vertical: 225
	Diagonal: 230	Diagonal: 375
FVA-2400-L*	Horizontal: 200	Horizontal: 325
	Vertical: 150	Vertical: 245
	Diagonal: 250	Diagonal: 400

***Select FVA-2400-L when inspecting multi-fiber or ribbon connectors with guide pins.**

FVA Benchtop Specifications

Dimensions	150 x 135 x 242 cm (5.9 x 5.3 x 9.5 in)
Weight	1.6 kg (3.6 lbs)
Controls	Autofocus; auto-inspect and analyze
Resolution	800 x 600 pixels
Connector type	USB 2.0 (with locking mechanism)
Cord length	183 cm (6 ft)
Camera sensor	2560 x 2048 (5 megapixel) monochrome; 1.27 cm (1/2.5-in) CMOS
Particle size detection	< 0.5 µm
Light source	Blue LED; 100,000+ hour life
Lighting technique	Coaxial
Power source	12VDC/500mA power input
Certification	CE
Warranty	1 yr

P5000 Digital Probe Microscope & FiberChek2™
Automated Fiber Inspection & Analysis Software & Probe
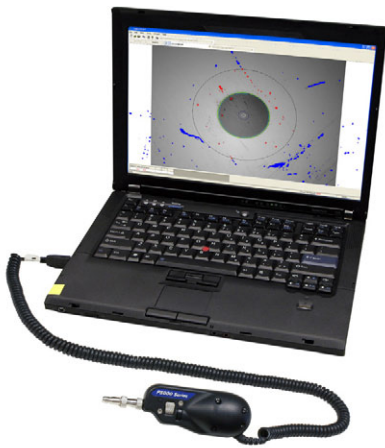
Laptop not included

Applications

- Inspect and analyze both the bulkhead (female) and patch cord (male) sides fiber interconnects

- Instantly capture, analyze, and grade fiber end face images and obtain a PASS/FAIL result according to pre-configured criteria setting

- Standardize fiber inspection, analysis, and grading process throughout fiber network

Key Features

- FiberChek2 software pre-programmed to comply with International Electrotechnical Commission (IEC) acceptance criteria standards for single-mode and multimode connectors

- Implements standards for inspection and grading throughout every stage of fiber handling

- Remove human subjectivity from fiber inspection and grading to ensure consistent results

- Configurability allows for user-defined controls and criteria settings

- Identify and characterize each defect and contamination particle, and determines their location relative to the fiber core

- Archive results and images as HTML or PDF files and generate integrated reports

- Plug it directly into PC/laptop via USB 2.0 connection

- Produce crisp, clear view of fiber end face condition with high-resolution 5MP camera and coaxial illumination
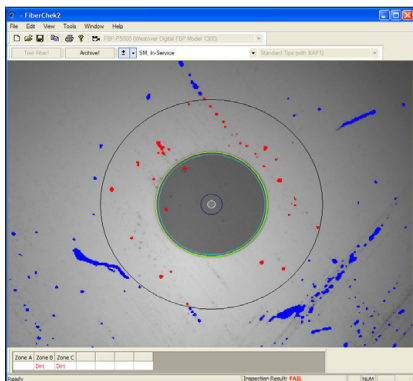
FiberChek2 and P5000 Digital Probe

FiberChek2 is an advanced application that determines the acceptability of optical fiber end faces through automated inspection and analysis. It identifies and characterizes defects and contamination and determines their location relative to the fiber core. It then provides a Pass or Fail result according to a pre-configured failure criteria setting.

The P5000 digital probe microscope connects directly to a PC or laptop via a USB 2.0 connection and the unique QuickCapture™ button lets users capture, inspect, and analyze a fiber end face image in a single automated step.

Note: The P5000 digital probe is not compatible with T-BERD/MTS platforms.

- QuickCapture™ Button
- Inspection Tip
- Barrel Assembly
- Focus Control
- USB 2.0 Connector
- 6 ft. Coil Cable

FiberChek2 User Interface

As different types of contamination are located and identified, FiberChek2 measures the size of each feature, determines its location relative to the core, and analyzes the collected data using an advanced logarithm to obtain a Pass or Fail result based on parameters configured for each predefined setting.

Because defects and contamination on or near the core surface typically affect the light transmission most significantly, they require the most aggressive examination. FiberChek2 defines the concentric areas around the core as zones which let users establish failure criteria by evaluating various defect categories, which include contamination, pit/chip and scratches.

Note: Zones are a series of concentric circles that identify areas of interest on the connector end face. The inner-most zones are more sensitive to contamination than the outer zones.

FiberChek2 HTML Summary Report

A **CORE** Zone

B **CLADDING** Zone

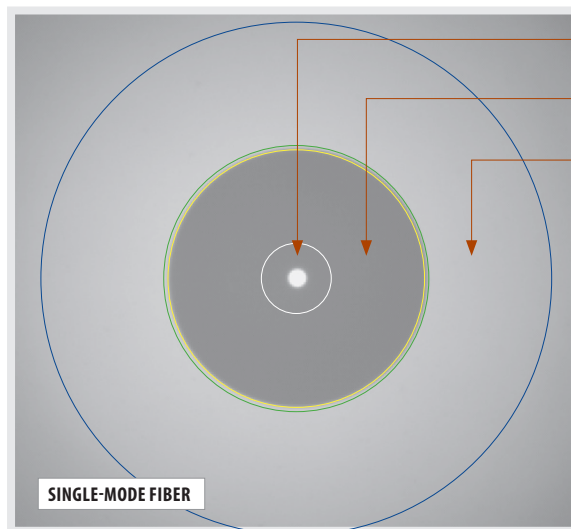**C** **FERRULE/CONTACT** Zone

Benefits

- Eliminate human subjectivity for consistent, standardized result when inspecting and grading fiber

- Configurability allows for user-defined Pass/Fail criteria settings

- Standardizes of inspection, analysis, and grading process throughout fiber networks

- Record and archive results in HTML or PDF formats

FiberChek2 Automated Procedures

1. Acquires the fiber image

2. Analyzes the image

3. Finds defects and their location to fiber core

4. Measures and evaluates the defects within each specified zone

5. Determines whether defects within the zones are acceptable according to the pre-configured failure criteria for each zone

6. Displays the results as Pass or Fail

7. Saves or prints all relative results in designated directory or printer, respectively

Profile Settings

Profile Settings
Single-mode (SM), Post Polish
Single-mode (SM), In-Service
Multimode (MM), Post Polish
Multimode (MM), In-Service
Ribbon, SM, Post Polish
Ribbon, SM, In-Service
Ribbon, MM, Post Polish
Ribbon, MM, In-Service
Small Form-factor Pluggable (SFP / Transceiver) Lenses

Calibration Settings

Calibration Settings
Standard Tips (with BAP1)
Standard Tips (with BAP2)
Mil/Aero Guides (with BAP3)
Simplex Long Reach (-L) Tips
E2000 Tips
Ribbon Tips
Ribbon Tips - Long Reach
FBPT-U12-A6 Tip
FBPT-SC-A6 Tip

P5000 Probe Specifications

Dimensions	140 x 46 x 44 mm (5.5 x 1.8 x 1.7 in)	
Weight	110 g (3.88 oz)	
LOW-Mag field-of-view (FOV)	Horizontal:	740 μm
	Vertical:	550 μm
	Diagonal:	920 μm
HIGH-Mag FOV	Horizontal:	460 μm
	Vertical:	345 μm
	Diagonal:	575 μm
Live image	800 x 600; 15 fps	
Connector	USB 2.0 (with latch lock)	
Cord length	183 cm (6 ft)	
Camera sensor	1280 x 1024 black and white, 1/3-in (1.27 cm) CMOS	
Particle size detection	<1 μm	
Light source	Blue LED, 100,000+ hour life	
Lighting technique	Coaxial	
Power source	USB port	
Certification	CE	
Warranty	1 yr	

Ordering Information

Product Code	Description
FBP-P5000	Digital fiber inspection probe microscope (USB 2.0); FiberChek2 software; FBPT inspection tip: Universal 2.5 mm patch cord tip; hard-sided carrying case
FBP-SD01	Digital fiber inspection probe microscope (USB 2.0); FiberChek2 software; interchangeable FBPT inspection tips (4) in hard case: SC and LC bulkhead tips, Universal 2.5 mm and 1.25 mm patch cord tips; hard-sided carrying case

Fiber Optic – Production and Lab Test Support
JDSU Advantage^{SM}

Adding Value with Global Services and Solutions

Gain the competitive advantage with our comprehensive portfolio of JDSU services and solutions that range from basic instrument support to program management of complex, company-wide initiatives. JDSU service professionals provide the knowledge, support, methodology, and techniques that improve network operations, customer satisfaction, and profitability.

For more information or to receive a quote, please call 1-800-406-9559 (option 2) or e-mail: support@jdsu.com

Product Support—Secure your investment

Calibration Services
– Factory calibration

– On-site calibration

– Third-party calibration

Repair Services
– Extended warranty

– Factory repair

– Third-party repair

Technical Assistance Center (TAC) Services
– 24/7 TAC support

System Management—Ensure reliability and performance

SystemCare Implementation Services
– JDSU Certified Equipment program (ACE) for refurbished equipment

– Deployment

– System training

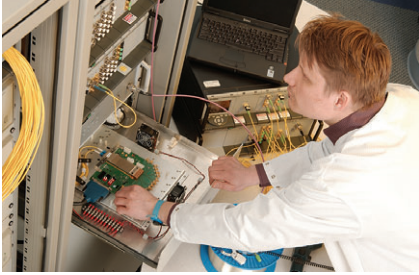– Re-certification for change of ownership

SystemCare Support Services
– Center support engineer

– Expedited hardware module sparing support

Education Solutions—Increase workforce knowledge and skills
– Virtual classroom

– Public training

– On-site training

Factory Calibration Services

Highlights

- Provides regular maintenance that extends the life of your instrument.
- ISO9000-certified calibration, including a calibration certificate for your records.
- Optional pre- and post-calibration data can be purchased with the Data Sheet option.

Key features

- Verify instrument measurement accuracy to traceable standards.
- Adjust instrument, as necessary, to ensure functionality within specifications.
- Document calibration with a certificate and data sheet.
- Provide top-level function test on instrument to verify product functions not requiring calibration, but are necessary for proper use.
- Perform preventative maintenance, including cosmetic repairs, cleaning of the displays and housing, and cleaning of the internal components to remove dust and debris.
- Perform minor repairs to keep the instrument running like new, and make mechanical adjustments to any loose or misaligned hardware.
- Incorporate factory engineering changes, as necessary, to optimize the function of the instrument. This may include anything from a component change to the replacement of an entire assembly.
- For optical instruments, clean all of the optics and verify proper function of the lasers and optical connections.
- Apply a calibration label to the instrument noting the calibration date, who calibrated the instrument, and date for next calibration.
- Perform simultaneous measurements on multiple wavelengths when used with cORL and cFPL units.

JDSU-certified Factory Calibration

Factory Calibration Services provide a way to have your instruments undergo an ISO-certified calibration that meets your schedule. Setting up a Calibration Plan Manager allows for discounts and logistical assistance. Calibration should be performed at the specified intervals to ensure that the instrument is operating at factory specifications.

Factory Repair

Key features
- Eliminates unnecessary returns or no fault found. JDSU Technical Assistance Center (TAC) personnel are available to work with the customer to resolve the issue or confirm the reported problem and obtain a detailed problem description (before assigning a return authorization number).
- Expedited repair services.

Highlights

- Repair service includes performing any ECNs and maintenance services specified for the instrument.

JDSU-certified Factory Repair

JDSU offers return-to-factory repair for all JDSU instruments. Our technicians will ensure that your instrument is functioning properly and will install any engineering change notifications (ECNs) before returning it. JDSU does not certify any other company to repair JDSU instruments. Furthermore, allowing other parties to attempt to repair JDSU instruments will result in voiding the warranty. Trust your instrument to the company that built it!

JDSU Extended Warranty

Highlights

- Provides the same no-hassle coverage as new product warranties.
- Allows for quicker instrument repair and eliminates paperwork. Requires a return authorization number from a JDSU customer service professional.
- Combine with calibration services to provide the most complete coverage for your instruments.

Key features
- Can be prorated to align warranty periods for numerous instruments.
- Repair and maintenance costs can become a budgeted line item versus an unexpected expense.

Extended warranty coverage for your JDSU instruments

An extended warranty eliminates unexpected expenses associated with a costly product or when purchasing coverage for products after the warranty has expired. We can prorate extended warranties to allow for simultaneous warranty expiration for a group of test instruments. Extended warranties provide a safe and easy way to ensure quick repair of your instruments so they are ready when you need them.

24/7 Technical Assistance Center (TAC) Support

Highlights

- Obtain best-in-class product support from 8:00 AM to 5:00 PM (EST).
- Get answers quickly to all of your product operation questions.
- Leverage our 75 years of telecommunications experience.
- 24/7 Emergency support

Contact Technical Assistance Center (TAC)

JDSU technical support is available 8:00 AM to 5:00 PM EST, Monday through Friday, excluding Canadian holidays. Emergency technical support is available 7 days a week, 24 hours a day. Dial one of the telephone numbers and follow the voice prompts to page a specialist.

North America	800 406-9559 (toll free)
Outside North America	+800 4069-5599 (toll free)
China	+10 800 140 5599 (toll free)
	Toll Free Access Codes by Country
E-mail	support@jdsu.com

SystemCare System Training

Key features

- Students gain knowledge and confidence to carry out real-world operation and analysis of passive component characterization using the OCETS Plus or SWS

- Students receive plenty of hands-on practice and discussion

Highlights

- Provides key information for those involved in the purchasing, sale, application, operation, maintenance or demonstration of this equipment

- Provides hands-on experience and real-time setup of equipment

- Allows practice of measurements to validate correct system operation

- Provides useful troubleshooting techniques and information to reduce production downtime

Who Should Attend JDSU SystemCare System Training

– Individuals who install test systems or equipment

– Individuals who set up, operate, or maintain this equipment

– Individuals who sell or demonstrate of this equipment

SystemCare Center Support Engineer

Highlights

- Builds on our classroom training with in-depth, on-the-job training.

- Offers complete flexibility to use a CSE's time for services that benefit your organization the most.

Key features

- On-site support for a specified number of days.

- Improve your business with the combination of on-the-job training, enhanced TAC support, system administration support, post-implementation support, and on-site repair.

Premium on-site assistance

A JDSU Center Support Engineer (CSE) is assigned to you to provide on-site support as an expert on your system and someone who understands your network. They can perform a variety of services according to your needs, including on-site training, enhanced technical support, system administration support, and on-site repair or calibration.

SystemCare Expedited Module Hardware Sparing Support

Highlights

- Replace hardware failures in days, not weeks.
- Guaranteed inventory of replacement parts.

Key features

- Inventory of dedicated spare parts at JDSU.
- Expedited shipment of spare parts within 48 hours or next business day, of notification by a TAC specialist.

Get replacement equipment faster

JDSU stocks an inventory of hardware modules outside of manufacturing. When the Technical Assistance Center (TAC) diagnoses a module failure, a new module is shipped out overnight prior to receiving the broken module.

JDSU

Test & Measurement Regional Sales