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**FREECALL 1800 680 680**

# Optical Component Environmental Test System

## OCETS Plus Series

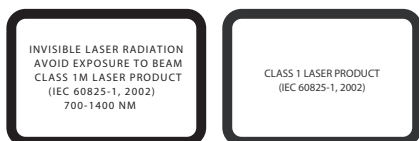


### Applications

- 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 850nm 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.



### Key Features

- High Return Loss option (HiRL) monitors RL up to 70dB
- Up to 210 device channels (420 ports)
- High insertion loss (IL) and return loss (RL) repeatability
- SpliceFree option provides repeatable RL measurements for connectorized components
- Full bi-directional testing
- Single mode and multi-mode 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 analogue grade SC switches. Therefore, the implementation of an OCETS Plus system represents an improvement over the capability of any in-house system that utilizes analogue grade SC switches.

In addition to the SC switches, OCETS Plus is a hardware platform that comprises Fabry-Perot lasers, an OTDR, 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.

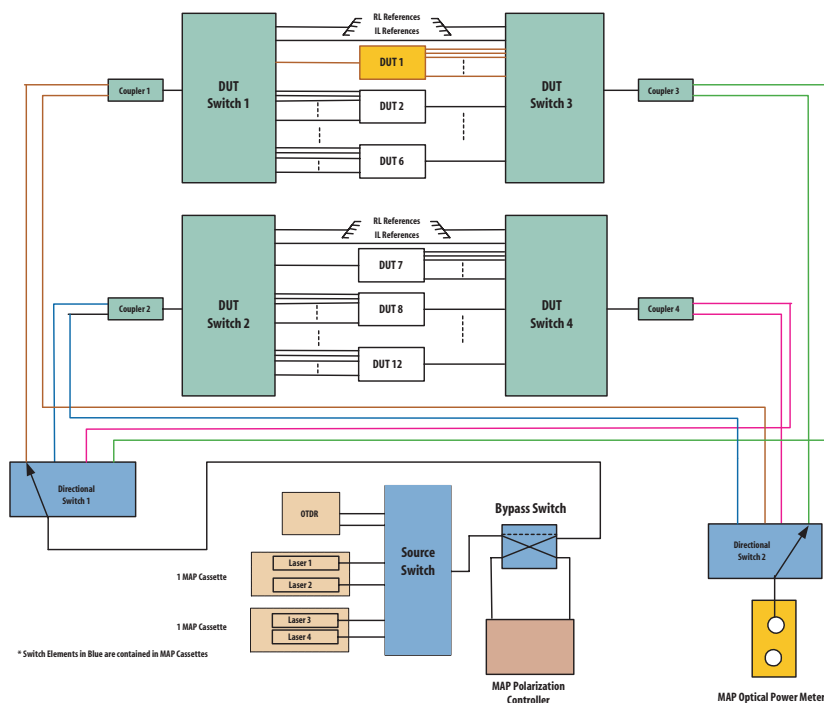


Figure 1: Bidirectional Test Configuration of 1x32 splitters, within a 210 channel (420 port) system



### About Environmental Testing

In order to be incorporated into modules and transmission systems, fiberoptic 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 70dB when the HiRL option is chosen. Classic OCETS was specified to 65dB, and was a limiting factor for test labs and manufacturers attempting to certify FC/APC connectors to a return loss level of 65dB. Besides the 70dB measurement capability, OCETS Plus is capable of delivering 210 user-channels (420 test ports) such that environmental tests involving twelve 1x32 splitters can be monitored bi-directionally, with an additional 5% channels available as reference spares. An option to add an OTDR provides SpliceFree measurement capability similar to mandrel-free test sets used in the manufacture of optical interconnect products such as jumpers and patchcords. By implementing an OTDR, users can effectively ignore the sources of backreflection found before the DUT and monitor RL at a specified location in the optical test circuit. Devices under test can simply be connected into the optical test circuit saving days of splicing time.

There are sixteen basic OCETS Plus system packages, and four main options that may be purchased to supplement the base system.

### 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, 105, 160, or 210 channel counts, with FC/APC connectors only, but with the extra option of having either 50um or 62.5um core fiber specified.



### OCETS Plus Options

Single mode systems have four major options: HiRL, SpliceFree, PDL, and Source. The first three options are seen as enhancements to the Base Package and are either present or not. The HiRL option enables users to monitor RL up to 70dB (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 SpliceFree option comes in either a two wavelength or four wavelength version. 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. The Source option is the only option that must be added to the Base Package. Users can choose from either a two wavelength system (1310/1550nm) or a four wavelength system (1310/1490/1550/1625nm).

Multi-mode systems are not provided with HiRL, SpliceFree, or PDL modes, and therefore have only the Source option. Users choose either 850/1310nm or 1310/1550nm as their multi-mode sources.

### 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 and SpliceFree drivers are also supplied on a separate CD if those options are purchased.

Users of classic OCETS systems may purchase EasyOCETS separately to upgrade legacy systems purchased between 2003 and 2007. Systems purchased prior to 2003 require a review by the JDSU Global Support and Services (GSS) group to assess suitability. EasyOCETS is available on a single CD and can be installed via an Install Wizard. All software is licensed for single-station usage.

### EasyOCETS Software

- Windows XP compatible
- Drag and drop style graphical user interface (GUI)
- Environmental chamber control
- Network communication enables email alerts and remote interfacing

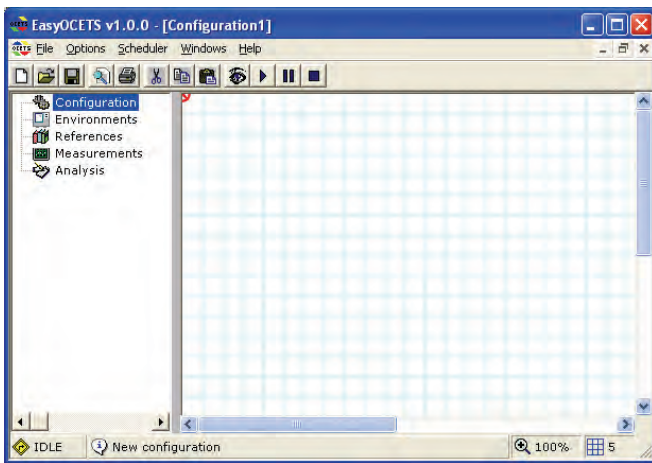


Figure 2: EasyOCETS main menu and configuration palette

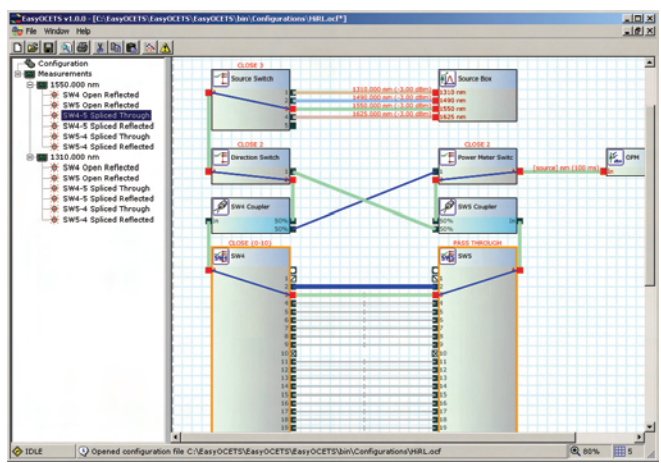


Figure 3: Setting up measurement cases

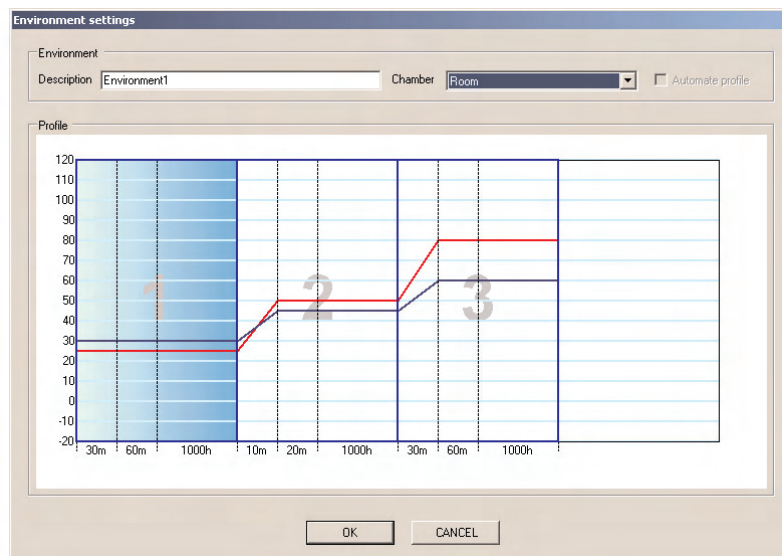
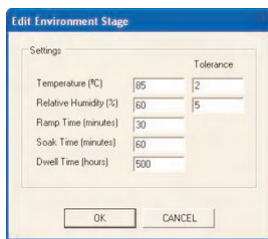


Figure 4: EasyOCETS Chamber Control Interface and Profile Screen

## OCETS Plus Specifications

Parameter	Single-mode (SM)	Multimode (MM)
Fiber Type	9/125 um fiber, standard 3 mm jacket	50/125 um or 62.5/125 um 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 HiRL option: +/-1 dB up to 65 dB +/-3 dB up to 70 dB Splice Free option: +/-3dB 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 < 2 seconds RL, HiRL, PDL < 5 seconds Splice Free option: IL, RL < 12 seconds	IL, RL < 2 seconds
Sources Available Note 1 Note 2	1310, 1490, 1550, 1625 +/-10 nm Fabry-Perot Lasers	850, 1300, 1550 +/-20 nm
Source Power Stability at 23°C Note 3	+/- 0.01 dB for 20 minutes	+/- 0.01 dB for 15 minutes
<b>General</b>		
Number of Channels	Up to 210 input, and 210 output (420 channel ports)	
Number of Reference Channels Note 4, Note 5	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	The equipment, excluding the computer, is installed in a single bay cabinet, 19 inch wide, 40U high, 36 inches deep (W x H x D = 19 x 70 x 36 inches). Glass Front door with smoked viewing feature installed Flush rear door vented at bottom Two flush side panels Top panel with 550 c.f.m. fan installed Four casters and four levelors Accessibility to lasers and power meter for periodic calibration at rear of the cabinet	
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. OCETS Plus uses a source switch that is capable of connecting up to four FP lasers and two OTDR VLR modules (when the SpliceFree option is chosen). External sources may be used if the SpliceFree option is not chosen.
2. Custom options are also available. The OCETS Plus platform is capable of supplying up to 24 discrete wavelengths for performing IL measurements. Contact JDSU for a custom part number and specifications.
3. JDSU recommends that references are taken every 20 minutes in order that source drift accounts for < +/-0.01dB error in IL repeatability.
4. The RL reference as utilized in the EasyOCETS software algorithms is a 0dB reflector. Users may add RL references to other ports.
5. Users are free to connect as many of the input and output ports as they wish to set up IL references.



## 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 email at [sales@jdsu.com](mailto:sales@jdsu.com).

### OCETSPLUSxxx+1yzz

#### Channels

Code xxx	Number of Channels
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055	055
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105	105
-----	-----

160	160
-----	-----

210	210
-----	-----

#### Fiber Type

Code y	Fiber Type (um)
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7	9/125
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1	50/125
---	--------

2	62.5/125
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#### Connector

Code zz	Connector Type
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FA	FC/APC
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NC	No connector
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### Options

Item #	Description
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<b>HiRL</b>	
21108282	HiRL High Return Loss Option

<b>SpliceFree</b>	
21104759-001	SpliceFree Option 1310/1550nm
21104759-002	SpliceFree Option 1310/1550/1490/1625nm

<b>PDL</b>	
21109083	PDL Polarization Dependant Loss Option

<b>Source</b>	
21104760-001	OCETS Single Mode Source 1310/1550nm
21104760-002	OCETS Single Mode Source 1310/1550/1490/1625nm
21104760-003	OCETS 50 µm fiber MM Source 850/1300nm
21104760-004	OCETS 50 µm fiber MM Source 1300/1550nm
21104760-005	OCETS 62.5 µm fiber MM Source 850/1300nm
21104760-006	OCETS 62.5 µm fiber MM Source 1300/1550nm

## 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 timeframe (2003-2007). The ordering code is 21099421 and has the description "HiRL driver for EasyOCETS". SpliceFree drivers cannot be purchased separately.

All software is licensed for single-station usage.



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