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 bi-directional 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 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, 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)

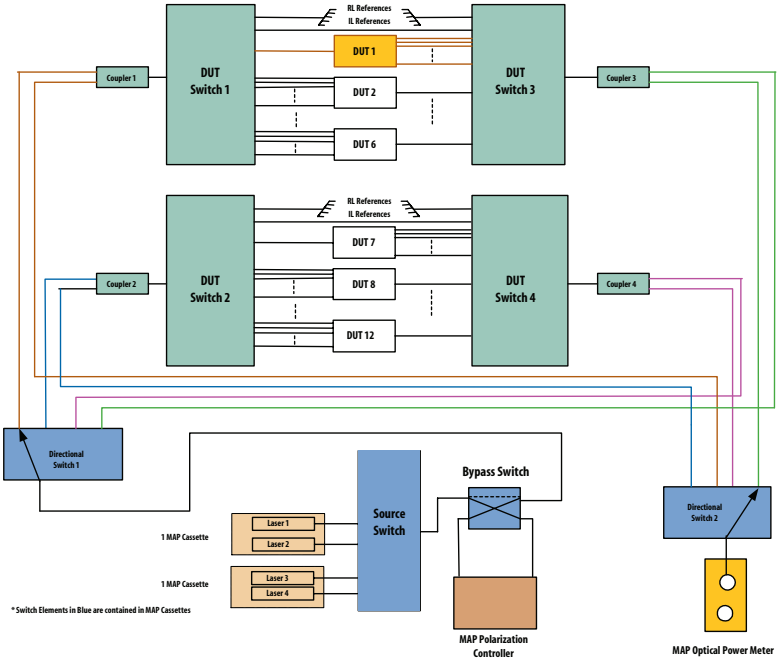


Figure 1 Bidirectional Test Configuration of 1x32 splitters, within a 210 channel (420 port) system

About Environmental Testing

In order to be incorporated into modules and transmission systems, 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 70 dB when the HiRL option is chosen. Classic OCETS was specified to 65 dB, and was a limiting factor for test labs and manu-facturers 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) such that environmental tests involving twelve 1x32 splitters can be monitored bi-directionally, 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 mm or 62.5 mm 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 compatible
- Drag and drop style graphical user interface (GUI)
- Environmental chamber control
- Network communication enables email alerts and remote interfacing

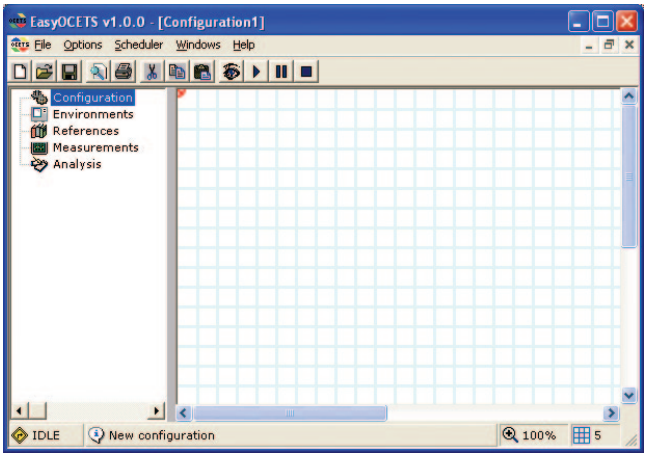


Figure 2 EasyOCETS main menu and configuration palette

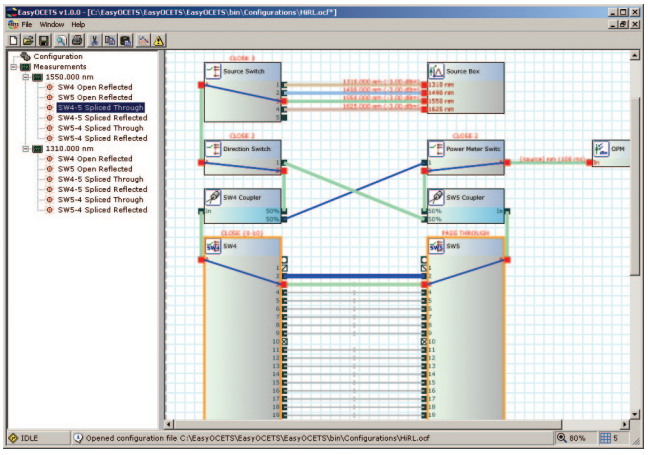
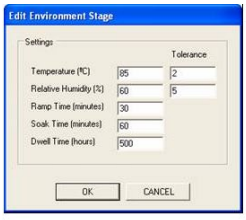


Figure 3 Setting up measurement cases



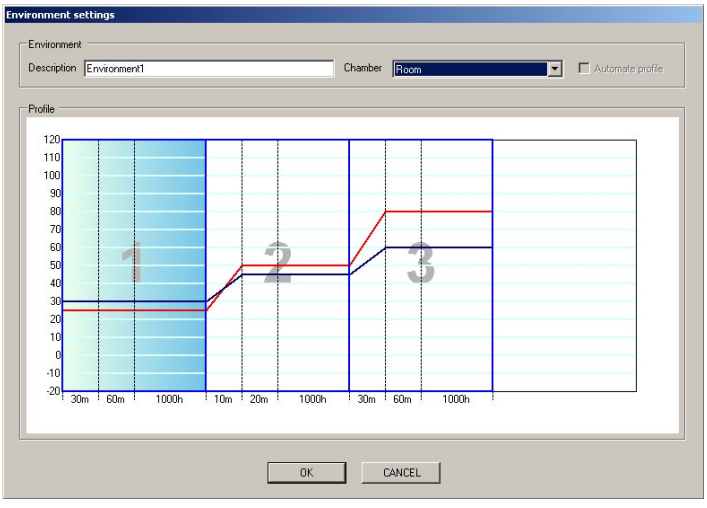


Figure 4 EasyOCETS Chamber Control Interface and Profile Screen

OCETS Plus Specifications

Parameter	Single-mode (SM)	Multimode (MM)
Fiber Type	9/125 µm fiber, standard 3 mm jacket	50/125 µm or 62.5/125 µm 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[6] PDL < 10 s	IL, RL <2 s
Sources Available[1, 2]	1310, 1490, 1550, 1625 ±10 nm Fabry-Perot Lasers	850, 1300 ±20 nm LED[5]
Source Power Stability at 23°C[3]	±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[4]	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. Measured immediately after calibration.
2. 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).
3. The number of channels(55 for example) means 55 input and 55 output.
4. 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.
5. Multimode launch conditions meet the requirements of IEC 61280-4-1 Ed2.
6. Averaged over 60 consecutive measurements, not including reference or saving to database.

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.

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