

# Very Long Range (VLR) OTDR Module

## Multi-application, high performance OTDR module



### Key Features

- CWDM/DWDM ready with 1310, 1383, 1490, 1550, and 1625 nm wavelengths
- FTTx ready with 1310/1490/1550 nm wavelengths
- 0.8 m event dead zone for highest network precision
- Point-to-multipoint (P2MP) testing with a combined high dynamic range and high resolution solution
- In-service testing with the filtered 1625 nm wavelength
- Identify ITU fiber type (G.65x A, B, C, and D) with water peak detection at 1383 nm
- Continuous wave (CW) functionality

### Multi-application optical test module

In today's telecommunications market, test solutions must be cost effective, increase productivity, and reduce the complexity of field testing. JDSU's Very Long Range (VLR) OTDR Module offers a high-performance OTDR test module, which has been specifically developed in response to these industry demands.

Configurable at the time of order, the VLR OTDR Module offers multiple wavelength test capabilities (1310, 1383, 1490, 1550, and 1626 nm), providing field technicians with an all-in-one test instrument.

Traditionally, 45 dB OTDRs have been constrained to very long haul testing. The VLR OTDR Module's performance enables effective testing on short haul (access, FTTx, P2MP), long haul, and very long haul networks.

### Test the fiber...with the right solution... at the right wavelength

As fiber installers and technicians continue to look for ways to reduce time and costs during field operation, it is essential for them to use the right tool for the job at hand. The combination of an unprecedented 0.1 s refreshing time, the shortest event resolution (0.8 m event dead zone and 4 m attenuation dead zone), and a 45 dB dynamic range, makes the VLR OTDR Module an ideal tool for the qualification of any type of fiber network.

A large range of wavelengths is available to best match any application:

- For metro networks, a four-wavelength (1310/1383/1550/1625 nm) VLR OTDR Module is used for fiber qualification linked to the water peak absorption (according to ITU standards G.652, G.655, and G.656). The VLR OTDR Module is the first commercially available four-wavelength 45 dB OTDR in the industry.
- For access networks, a three-wavelength (1310/1490/1550 nm) VLR OTDR Module is used for fiber qualification at FTTx transmission wavelengths.
- For in-service testing and troubleshooting of metro and access applications, a dedicated and optimized 1625 nm wavelength is available.

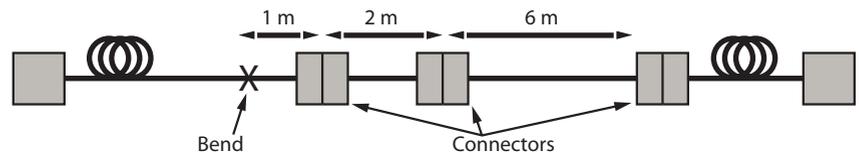
### A new standard in OTDR performance

The VLR OTDR Module is a very high performance OTDR and is capable of characterizing sections of singlemode fiber links that have been illusive in the past. With a 0.8 m event dead zone, it is now possible to qualify and troubleshoot problems in never before investigated sections of the fiber link.

- Pinpoint any fault in the network.
- Discriminate a failure or break within the patch panel or distribution frame.
- Reduce testing time for medium and long haul fiber network commissioning.
- Obtain a superior and cleaner trace form for high link loss for best fault detection.



High resolution for detection of bends and close events





### Improve productivity and efficiency in the field with JDSU's innovative software

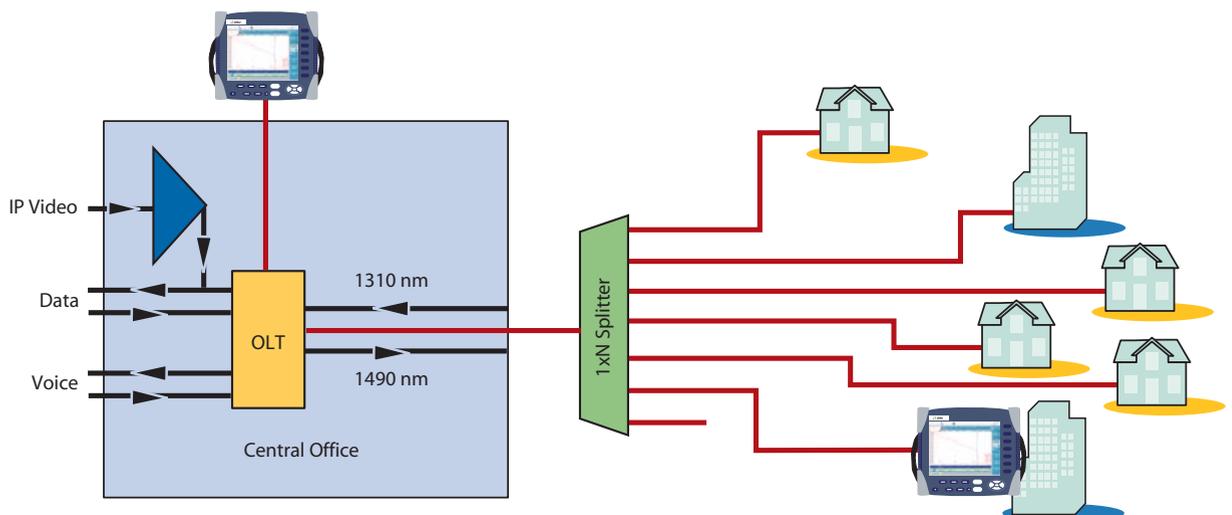
With the VLR OTDR Module's impressive performance, testing, and troubleshooting capabilities, the amount of time required to characterize a fiber network is drastically reduced. Test any fiber link or network configuration in record time.

- The VLR OTDR Module configures itself with its automated functionality and sets the best-suited acquisition parameters, including optimized acquisition times, as defined by the instrument.
- Obtain the trace form with the correct auto zoom, evaluate the fiber link, and save the results in record time!
- Minimize handling errors with the pass/fail indicator. By viewing a quick snapshot, technicians can easily identify incorrect results.

### Test through a PON splitter with the best available performance

With the combination of an impressive acquisition time, event dead zone, and dynamic range, FTTH technicians are able to test through a splitter with unprecedented accuracy using the VLR OTDR Module.

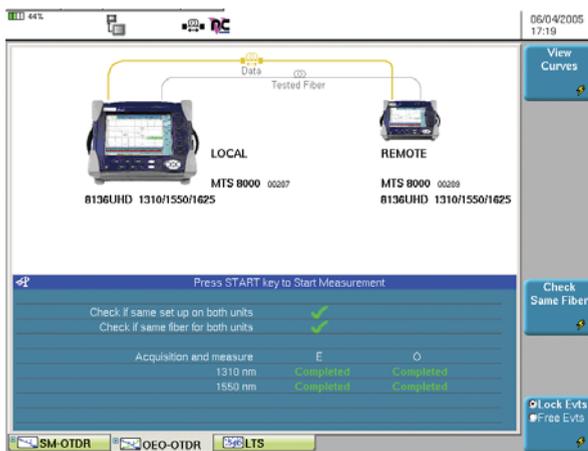
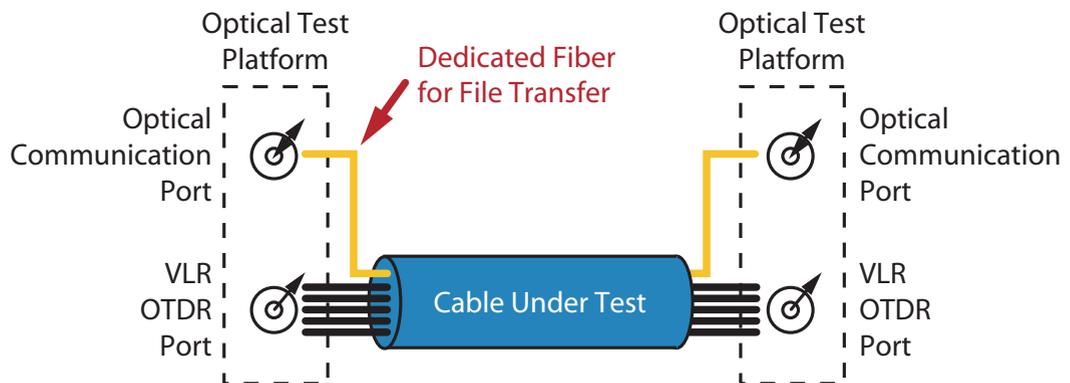
- In compliance with ITU-T G.983.3, the VLR OTDR Module provides a three-wavelength version at 1310/1490nm/1550 nm, expanding its test capabilities to FTTH/PON.
- Provides splice and connector information at the three PON wavelengths.
- Combines a high dynamic range and short event resolution in order to characterize short fiber lengths and measure through the splitters.
- Integrates splitter management data in the table results.



### One button bi-directional OTDR acquisition and analysis

Added to the MTS/T-BERD platforms' automated bi-directional OTDR acquisition process, the VLR OTDR Module offers an essential tool for the acceptance testing of new cable deployments.

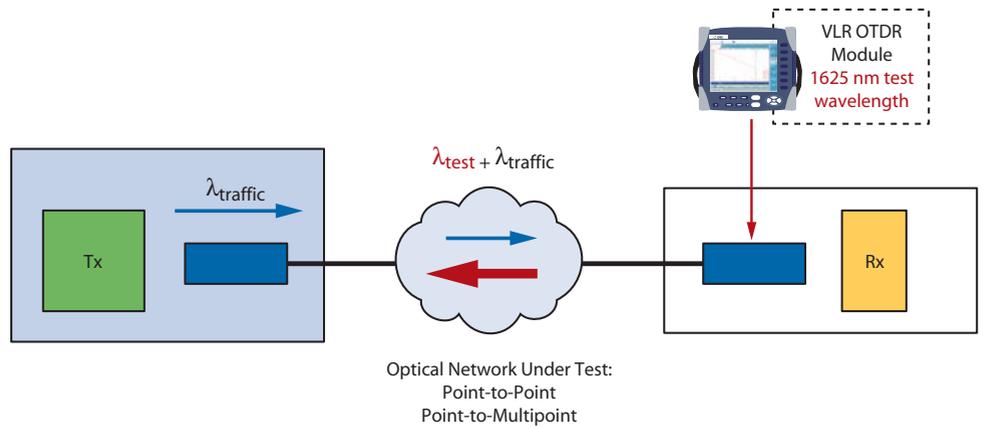
- Configuration synchronization at both ends for error-free test setup.
- Fiber continuity check capability.
- Automatic measurement procedure with the master-master operation.
- Exchange results from both ends through the fiber.
- Pass/fail indication minimizes handling errors.



### In-service testing at 1625 nm

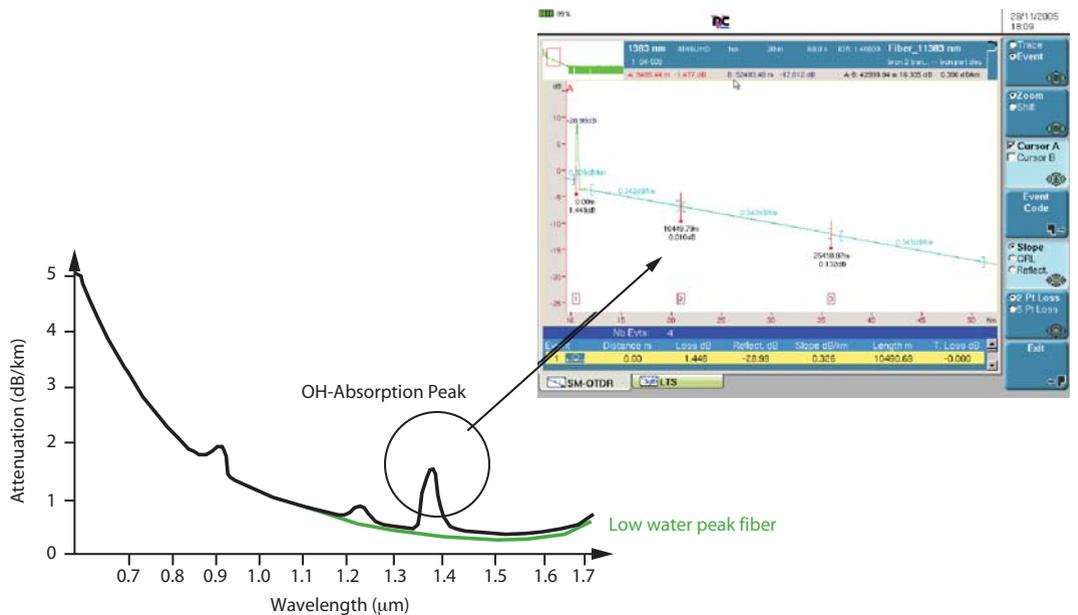
The VLR OTDR Module includes a filtered 1625 nm wavelength for in-service testing.

- Raman compensation for high power 1550 nm transmission analysis, including counter- or co-propagation signal management.
- More robust for high power CW transmission signal influence.



### Water peak detection at 1383 nm for CWDM applications

Since legacy fibers have high attenuation values in the 1383 nm region, loss results must be verified using the VLR OTDR Module.



**Insertion loss table**

Order #	Order	Length (ft)	Loss (dB)	Attenuation (dB)	Loss (dB)	Attenuation (dB)
1	1000	1000	0.15	0.15	0.15	0.15
2	1000	1000	0.15	0.15	0.15	0.15
3	1000	1000	0.15	0.15	0.15	0.15
4	1000	1000	0.15	0.15	0.15	0.15
5	1000	1000	0.15	0.15	0.15	0.15
6	1000	1000	0.15	0.15	0.15	0.15
7	1000	1000	0.15	0.15	0.15	0.15
8	1000	1000	0.15	0.15	0.15	0.15
9	1000	1000	0.15	0.15	0.15	0.15
10	1000	1000	0.15	0.15	0.15	0.15
11	1000	1000	0.15	0.15	0.15	0.15
12	1000	1000	0.15	0.15	0.15	0.15
13	1000	1000	0.15	0.15	0.15	0.15
14	1000	1000	0.15	0.15	0.15	0.15
15	1000	1000	0.15	0.15	0.15	0.15
16	1000	1000	0.15	0.15	0.15	0.15
17	1000	1000	0.15	0.15	0.15	0.15
18	1000	1000	0.15	0.15	0.15	0.15
19	1000	1000	0.15	0.15	0.15	0.15
20	1000	1000	0.15	0.15	0.15	0.15
21	1000	1000	0.15	0.15	0.15	0.15
22	1000	1000	0.15	0.15	0.15	0.15
23	1000	1000	0.15	0.15	0.15	0.15
24	1000	1000	0.15	0.15	0.15	0.15
25	1000	1000	0.15	0.15	0.15	0.15
26	1000	1000	0.15	0.15	0.15	0.15
27	1000	1000	0.15	0.15	0.15	0.15
28	1000	1000	0.15	0.15	0.15	0.15
29	1000	1000	0.15	0.15	0.15	0.15
30	1000	1000	0.15	0.15	0.15	0.15
31	1000	1000	0.15	0.15	0.15	0.15
32	1000	1000	0.15	0.15	0.15	0.15
33	1000	1000	0.15	0.15	0.15	0.15
34	1000	1000	0.15	0.15	0.15	0.15
35	1000	1000	0.15	0.15	0.15	0.15
36	1000	1000	0.15	0.15	0.15	0.15
37	1000	1000	0.15	0.15	0.15	0.15
38	1000	1000	0.15	0.15	0.15	0.15
39	1000	1000	0.15	0.15	0.15	0.15
40	1000	1000	0.15	0.15	0.15	0.15
41	1000	1000	0.15	0.15	0.15	0.15
42	1000	1000	0.15	0.15	0.15	0.15
43	1000	1000	0.15	0.15	0.15	0.15
44	1000	1000	0.15	0.15	0.15	0.15
45	1000	1000	0.15	0.15	0.15	0.15
46	1000	1000	0.15	0.15	0.15	0.15
47	1000	1000	0.15	0.15	0.15	0.15
48	1000	1000	0.15	0.15	0.15	0.15
49	1000	1000	0.15	0.15	0.15	0.15
50	1000	1000	0.15	0.15	0.15	0.15

Example of test report

**Error-free professional report generation**

A complete PC-based software application within a Microsoft Windows environment offers detailed generation of professional OTDR trace reports.

- Proof-of-performance reports with a high degree of customization capabilities.
- Dedicated tables are provided for each test result (splice loss, connector, and length).
- Out-of-range value summaries are provided with analysis of macro-bends.
- Compare results between the different wavelengths to identify bends and constraints.
- Complete fiber characterization reports, including OTDR, CD, PMD, and spectral attenuation.

**Enhanced testing solution**

With the scalable design of the MTS/T-BERD platforms, field technicians can quickly and easily plug-in the appropriate test module to perform precise measurement from the outside plant to the central office. The optical test platforms offer a full range of fiber characterization test modules with OTDR, CD, and spectral attenuation measurement, as well as DWDM testing capabilities.

With this new VLR OTDR Module and the current range of available OTDR modules, JDSU's test solution is the broadest offering on the market, making JDSU the provider of choice for all telecommunications operators and fiber optic installers.

The VLR OTDR Module can be combined with additional measurement capabilities in JDSU's optical test platforms so that technicians can fully characterize the fiber network with an all-in-one solution:

- Optical insertion loss
- Optical return loss
- OTDR
- Chromatic dispersion
- Polarization mode dispersion
- Spectral attenuation profile



MTS/T-BERD 8000 platform with OTDR and OFI modules

**Specifications**
**General (typical at 25°C)**

Weight	0.6 kg (1.1 lb)
Dimensions (w x h x d)	213 x 124 x 32 mm (8.38 x 4.88 x 1.26 in)

**Optical Interfaces**

Applicable fiber	SMF 9/125 $\mu$ m
Interchangeable optical connectors	FC, SC, DIN, ST, LC

**Technical Characteristics**

Distance units	Kilometers, feet, and miles
Group index range	1.30000 to 1.70000 in 0.00001 steps
Number of data points	Up to 128,000 data points
Distance measurement	Automatic or dual cursor
Display span	5 km to 380 km
Cursor resolution	1 cm
Sampling resolution	4 cm
Accuracy	$\pm 1$ m $\pm$ sampling resolution $\pm 1.10$ -5 x distance (Excluding group index uncertainties)

**Attenuation Measurement**

Automatic, manual, 2-point, 5-point, and LSA	
Display span	1.25 dB to 55 dB
Display resolution	0.001 dB
Cursor resolution	0.001 dB
Accuracy	$\pm 0.05$ dB $\pm 0.05$ dB/dB
Threshold	0.01 to 5.99 dB in 0.01 dB steps

**Reflectance/ORL Measurements**

Automatic or manual	0.01 dB
Display resolution	-11 dB to -99 dB in 1 dB steps

**Ordering Information**

Very Long Range	
1625 nm OTDR Module	E8117RVLR
Very Long Range	
1310/1550 nm OTDR Module	E8126VLR
Very Long Range	
1550/1625 nm OTDR Module	E8129VLR
Very Long Range	
1310/1550/1625 nm OTDR Module	E8136VLR
Very Long Range	
1310/1490/1550 nm OTDR Module	E8138VLR49
Very Long Range	
1310/1383/1550/1625 nm OTDR Module	E8148VLR38
Continuous Source option	E800DRLS

**Universal Optical Connectors**

Straight connectors	EUNIPCF, EUNIPCSC, EUNIPCST, EUNIPCDIN, EUNIPCLC
8" angled connectors	EUNIAPCF, EUNIAPCSC, EUNIAPCST, EUNIAPCDIN, EUNIAPCLC

For more information on the MTS/T-BERD platforms, test modules, adapters, cables, and fiber optic couplers, refer to the separate datasheets and brochures.

**OTDR Optical Performance**

These are standard specifications, representing only a selection of JDSU's offerings. For specific requirements, please contact your local JDSU representative.

Central Wavelength <sup>1</sup>	1310 nm $\pm 20$ nm	1383 nm $\pm 2$ nm	1490 nm $\pm 15$ nm	1550 nm $\pm 20$ nm	1625 nm $\pm 20$ nm <sup>5</sup>
Laser safety class (21 CFR)	Class 1M	Class 1M	Class 1M	Class 1M	Class 1M
Pulsewidth	3 ns to 20 $\mu$ s	3 ns to 20 $\mu$ s	3 ns to 20 $\mu$ s	3 ns to 20 $\mu$ s	3 ns to 20 $\mu$ s
Distance range	Up to 380 km	Up to 380 km	Up to 380 km	Up to 380 km	Up to 380 km
RMS dynamic range <sup>2</sup>	45 dB	43 dB	42 dB	43 dB	43 dB
Event dead zone <sup>3</sup>	0.8 m	0.8 m	0.8 m	0.8 m	0.8 m
Attenuation dead zone <sup>4</sup>	4 m	4 m	4 m	4 m	4 m
Continuous wave output power	0 dBm	0 dBm	0 dBm	0 dBm	0 dBm

<sup>1</sup>Laser at 25°C and measured at 10  $\mu$ s. Please contact us for other wavelengths

<sup>2</sup>The one-way difference between the extrapolated backscattering level at the start of the fiber and the RMS noise level (after 3 minutes averaging)

<sup>3</sup>Measured at  $\pm 1.5$  dB down from the peak of an unsaturated reflective event

<sup>4</sup>Measured at  $\pm 0.5$  dB from the linear regression using a FC/PC type reflectance

<sup>5</sup> $\pm 10$  nm for in-service measurement

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