RXT-4114

CWDM OTDR Module

VeEX

for RXT-1200
Modular Test Platform

The RXT-4114 CWDM OTDR module features all ITU-T defined CWDM wavelengths offering complete attenuation profiling and end-to-end connectivity measurement from a single test port ensuring maximum productivity. Up to 500,000 data point sampling resolution offers unprecedented network characterization.

Platform Highlights

Software

- Advanced software architecture supports multiple test applications
- VeExpress™ Cloud or Enterprise versions to maintain instrument firmware and manage test options or inventory
- ReVeal™ PC and EZ Remote software for flexible remote control
- Fiberizer™ Desktop PC software for advanced trace analysis and report generation
- Fiberizer Cloud trace analysis and data management
- R-server compatibility for centralized work force management and test results repository
- Optional Fiber Inspection Scope (USB) with single or multi-fiber (MPO/MTP) support

Hardware

- High resolution, 7" full color TFT touch-screen viewable in any lighting condition
- Connectivity via 10/100Base-T Management interface, WiFi™, Bluetooth®, or 3G/LTE for back office applications
- Intelligent fan operation with built-in temperature sensor
- Interchangeable Li-ion battery pack for extended test time
- USB-A interface for USB flash drives, USB wireless dongles and fiber inspection probe connection
- Optional built-in GPS module for Geotagging OTDR traces

Key Features

Optical

- CWDM wavelengths per ITU-T G.694.2 (18 channels)
- Sampling resolution up to 500,000 points
- Event dead zone < 1m, Attenuation dead zone < 4m
- High dynamic range for testing through CWDM Mux/demux
- Telcordia GR-196 and SR-4731.sor file formats
- Optional V-Scout mode – Intelligent Link Mapping using intuitive icons derived from multiple test acquisitions
- Optional CWDM light source via OTDR port
- Optional broadband Optical Power Meter
- Built-in launch fiber to characterize OTDR connections and short fiber spans
- Universal 2.5 mm optical interface with interchangeable optical adaptors (SC/FC/LC)

Add value with
**Fiberizer** Cloud
www.fiberizer.com

Wavelength-Division Multiplexing Primer

Overview

Wavelength-Division Multiplexing (WDM) has become the technology of choice for high-capacity optical communication systems. WDM allows service providers to expand the capacity of their networks without having to install additional fiber.

CWDM

Coarse WDM employs 18 wavelengths with 20 nm channel spacing ranging from 1270 nm and 1610 nm. The ITU-T G.694.2 grid was amended in 2003 to shift the wavelength by 1nm, so the center wavelengths are actually 1271 to 1611 nm. The wide channel spacing allows for the use of cheaper network components, including uncooled lasers and lower-quality multiplexers and de-multiplexers. By today's standards, several CWDM wavelengths below 1470 nm are considered "unusable" on older G.652 fibers, due to the increased attenuation in the 1270-1470 nm bands. Newer fibers conforming to the G.652.C and G.652.D standards reduce the "water peak" attenuation considerably and can support full operation of all 18 CWDM channels. The CWDM spectrum prevents the use of erbium-doped fiber amplifiers which are generally optimized for 1550 nm transmission. As a result, CWDM deployments are limited to ± 80 km and equipment is designed for short-range access and metro operation only.
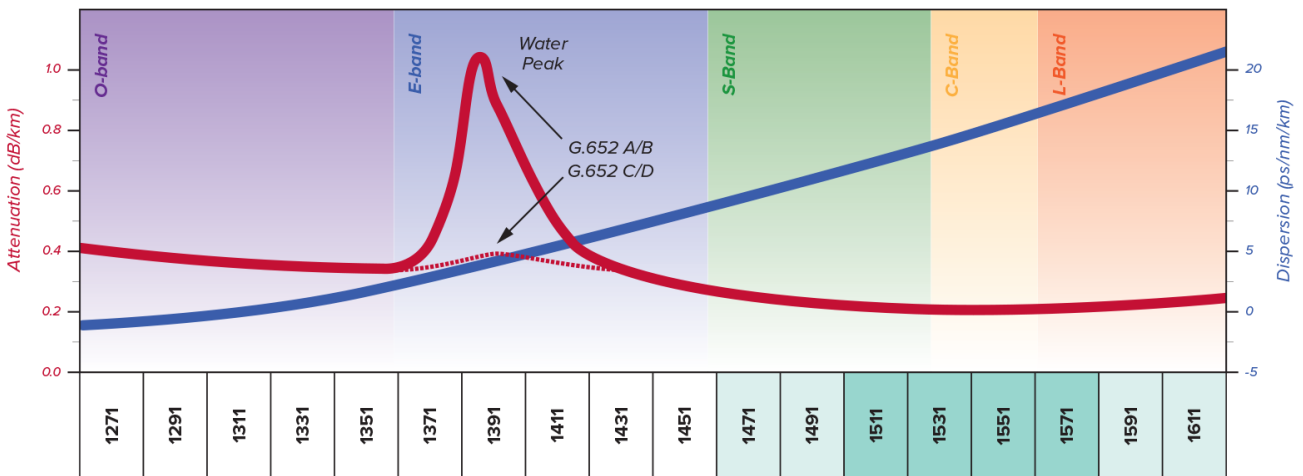
Test Applications

- Verify fiber network at the discrete ITU-T grid wavelengths
- Test end-to-end loss through multiplexers, OADM and de-multiplexers
- Attenuation and macro-bending can be verified across the transmission band
- End-to-end continuity testing using source and Optical Spectrum Analyzer (OSA) prior to service activation
- Wavelength provisioning - verify new wavelength services and routing without disrupting traffic on live channels
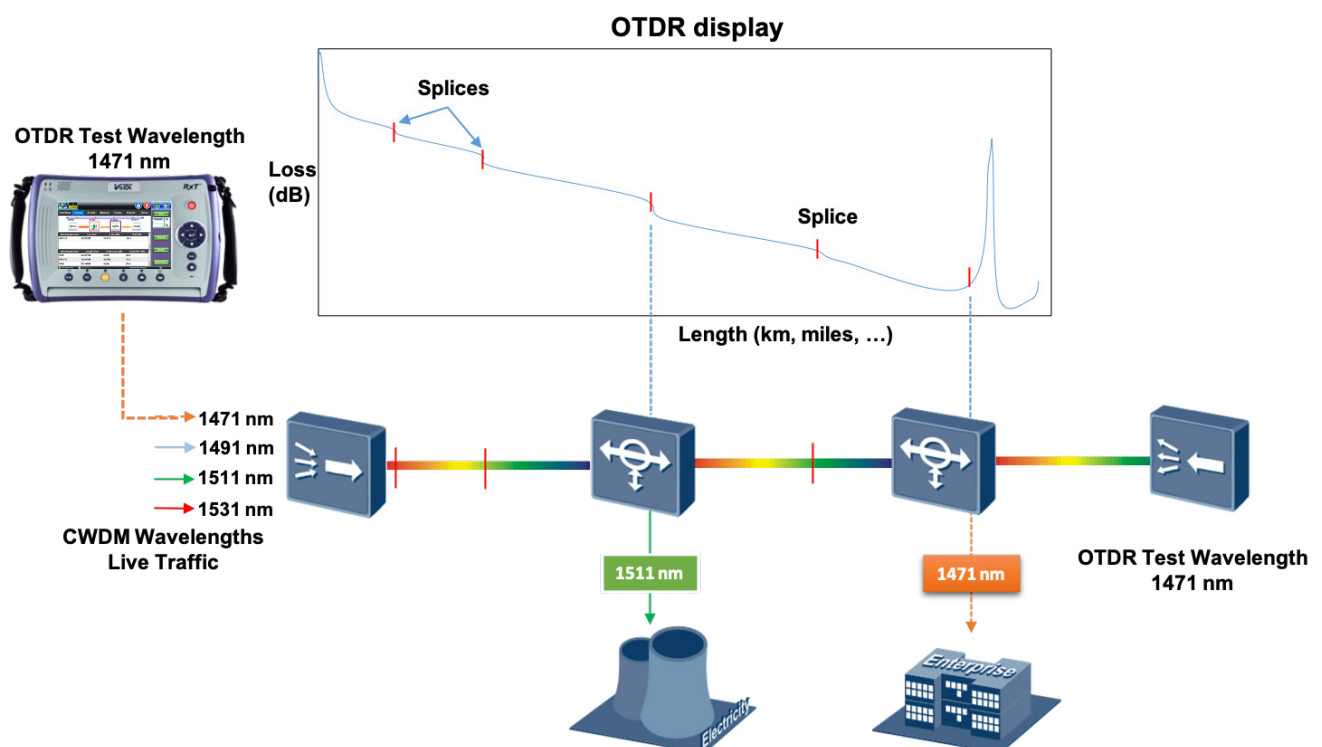
Optical Time Domain Reflectometer (OTDR)

Intuitive Test Setup

Novice and expert users can quickly and easily configure test parameters. All 18 wavelengths defined in the ITU-T G.694.2 grid are selectable via pull down menu.


Analysis and Pass/Fail Thresholds

User defined thresholds for splice/connector loss, fiber length, reflectance and ORL can be preset to assess a fiber's condition.


V-Scout Link Mapping

Advanced algorithms analyze multiple test acquisitions and characterize the fiber using intuitive icons. This optional feature eliminates trace interpretation and provides greater fiber analysis confidence to the user, regardless of OTDR skill set.
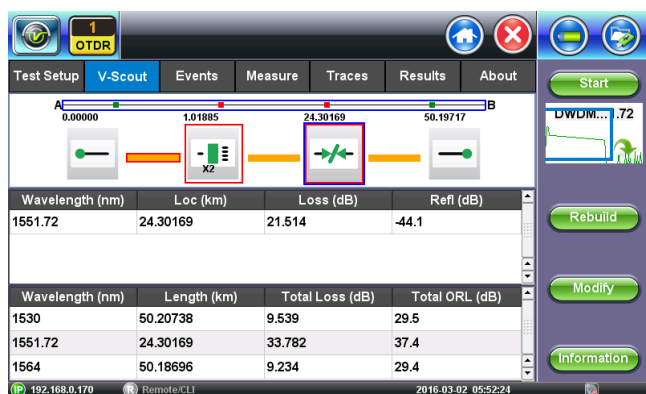

Advanced Trace Analysis

Reliable event detection and accurate analysis are crucial to document fiber links at the time of installation. These baseline records are essential to troubleshooting faulty networks and reducing system downtime afterwards.
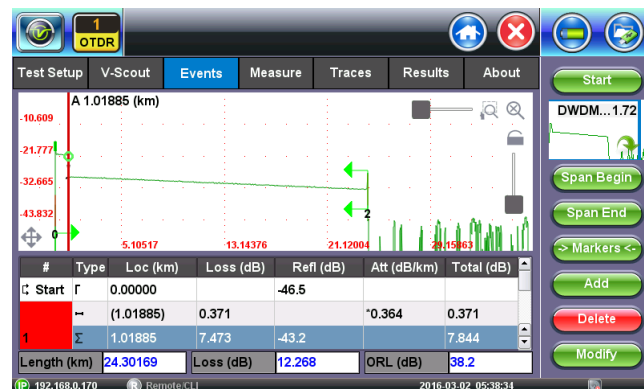

The unit employs specialized software algorithms developed from decades of experience to measure fiber attenuation including anomalies such as connectors, splices, and macro-bends.
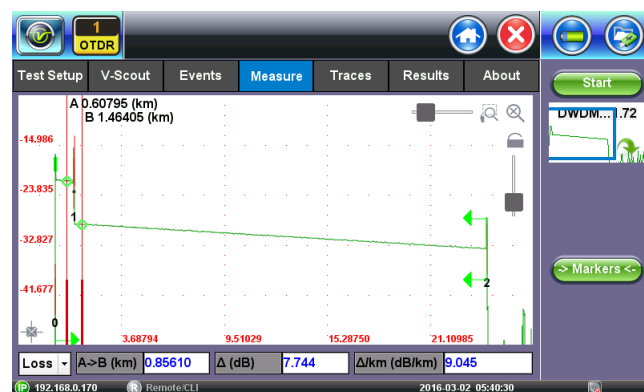
OTDR Results

OTDR Traces are saved in Telcordia SR-4731 format in a logical hierarchy for easy sorting and storage.

Traces can be pushed directly to Fiberizer Cloud using any available internet connection or can be pulled for fault finding and reference purposes.
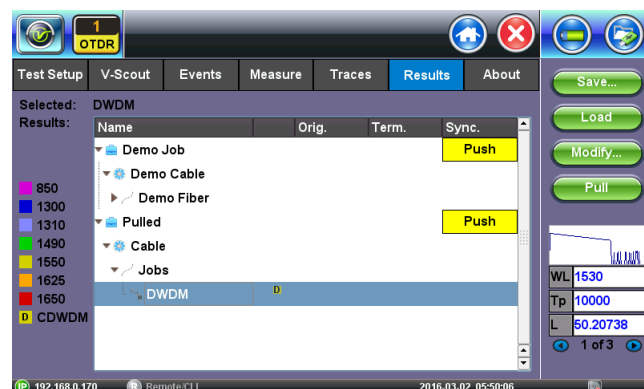
OTDR Trace Analysis and Documentation

Fiberizer Desktop Plus

Fiberizer Desktop Plus is a PC software application to analyze traces acquired by the RXT-4114 CWDM OTDR. Supplied as a standard accessory, users can edit traces manually, create event tables, generate reports using built-in templates, and much more. This viewer displays trace files conforming to Telcordia (Belcore) GR-196 & SR-4731 *.sor formats, and offers both 2-point and 5-point loss measurement modes. It also supports batch processing, a very useful feature for analyzing multiple fibers in a single cable. The software does not require internet access to operate, but it can be interfaced with Fiberizer Cloud OTDR trace viewer at any time.

Work from Anywhere, Anytime

Fiberizer Cloud

Fiberizer Cloud not only empowers the OTDR, but also the workforce. Going way beyond traditional OTDR reporting methods or concepts, this cloud-based solution provides superior centralized test data management capabilities including powerful web based trace analyses. You can work from almost anywhere, at any time because Fiberizer Cloud is a full online web service.

Streamlining Onsite Data Reporting

Fiber technicians and contractors tasked to validate new fiber installations or restoring cable routes after an outage are generally obliged to submit measured data (.sor files) and related documentation to the network operator as proof of delivery before being paid. Valuable time however is often wasted after the onsite work is completed, because critical test files are usually first stored to some local storage media before being transferred to a colleague via email for verification and further reporting.

Fiberizer Cloud streamlines this information exchange, eliminating costly paper, e-mail or other time consuming communication methods - instead, time wastage can be avoided by transferring traces of jobs completed directly from the OTDR to Fiberizer Cloud. Professional PDF or MS Excel reporting functionality is also available, and users can create their own templates for reports. Bi-directional analysis of OTDR traces, tested from both ends of the optical fiber, can also be performed.

Fiberizer Cloud Connectivity

Connect the RXT-4114 OTDR to the Internet and efficiently upload OTDR, OPM, Fiberscope test data directly to the cloud server using any available wireless technology (3G/LTE, WiFi).

Total Compatibility

Fiberizer Cloud is HTML5 compliant and is compatible with all browsers, not limiting users to PC platforms only. OTDR trace files in Telcordia SR-4731 *.sor formats are transferred via HTTPS connection, a fast, secure and reliable communication protocol commonly used in today's Internet applications. Another outstanding feature is compatibility with other OTDR vendor trace data formats, so users can reference or compare other OTDR traces and vice versa.

Optical[1]

OTDR Parameter	
CWDM Wavelength range (nm)	1270, 1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1570, 1590, 1610
CWDM Wavelength Accuracy (± nm)	3
CWDM spacing per ITU-T 694.2 grid (nm)	20
Number of Channels (CWDM)	18
Dynamic Range – CWDM (dB)[2]	39.5
Pulse Widths (ns)	3, 10, 25, 100, 300, 500, 1000, 3000, 10000, 20000
Event Dead Zone (m)[3]	< 1
Attenuation Dead Zone (m)[4]	< 4
Distance Display Range (km)	1.0 to 400
Distance Units	Kilometers, Meters, Kilofeet, Feet, Miles
Distance Accuracy (m)[5]	$\pm\,(0.5 + \text{resolution} + 2 \times 10^{-5} \times L)$
Sampling Resolution (m)	0.03 to 8.2
Sampling Points	Up to 500,000
Loss Readout Resolution (dB)	0.001
Attenuation Linearity (dB/dB)	± 0.03
Group Index Range (IoR)	1.2000 to 1.8000 in .0001 steps
Measurement Time	Fixed time intervals, Auto and Real Time (Live)
Internal Memory Capacity (SD card)	>10,000 traces & link maps, Bellcore GR196 and Telcordia SR-4731 sor format
Fiber Analysis	Automatic, event table, user defined PASS/FAIL thresholds
Intelligent Link Mapping (V-Scout)	Intelligent Link Mapping using intuitive icons derived from multiple test acquisitions
Fiber Type	Single mode, 9/125 µm
OTDR Laser Safety	IEC 60825-1, Class 1M
Optical Connectors (OTDR/LS)	Fixed or Universal 2.5 mm, UPC or APC interface, FC/SC/ST/LC adaptors (optional)

Hardware Options
Standard OPM +10 dBm
High Power OPM +25 dBm
VFL (650nm) Class 2
Light Source 0pt (per OTDR laser)

Notes:

1. Unless noted, all specifications are valid at 23°C ± 2°C (73.4°F ± 3.6°F) using FCUPC connectors
2. Typical dynamic range after three-minute averaging and SNR = 1
3. Typical dead zone using 3 ns pulse and reflections below -45 dB
4. Typical dead zone using 3 ns pulse and reflections below -55 dB
5. Excludes uncertainty due to fiber refractive index (IoR) setting

General Specifications

Size	290 x 140 x 66 mm (W x H x D)	Display	TFT 7" full color touch-screen display
	11.40 x 5.50 x 2.60 in	Ruggedness	Survives 1m drop to concrete on all sides
Weight	Less than 3 kg (less than 6.6 lb)		
Battery	Li-ion smart battery, 5200 mAh 10.8 VDC	Management Interfaces	USB, RJ45, 10/100-T Ethernet,
Power Supply (AC Adaptor)	Input: 100-240 VAC, 50-60 Hz		Bluetooth (optional), Data Card/GPS (optional)
	Output: 16 VDC, 5.5 A		WiFi (optional)
Operating Temperature	0˚C to 50˚C (32˚F to 113˚F)		
Storage Temperature	-20˚C to 70˚C (-4˚F to 158˚F)	Languages	Multiple languages supported
Humidity	5% to 95% non-condensing	System Memory	128 Mbyte RAM, 16 Gbyte SD