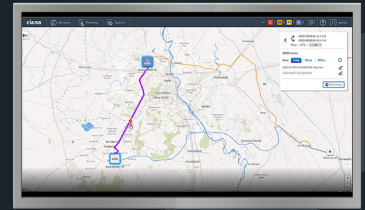


# PinPoint OTDR

Liquid Spectrum Analytics Apps



## Faster Troubleshooting and Proactive Maintenance

Fiber integrity can make or break network performance. Part of Ciena's Liquid Spectrum™ Analytics Apps, PinPoint OTDR enables operators to provide their customers with the highest reliability and availability. PinPoint OTDR creates a complete fiber loss profile—similar to taking a CT scan of the network—to precisely localize potential trouble spots, reduce the risk of outages, and accelerate repair times from days to hours. The end results are maximum network performance and customer trust.

PinPoint OTDR uses Ciena's Manage, Control and Plan (MCP) domain controller and WaveLogic™ Photonics—a fully instrumented, reconfigurable photonic layer—to transform day-to-day operations of the photonic network. PinPoint OTDR leverages Optical Time Domain Reflectometer (OTDR) capabilities that are integrated directly into Ciena's Packet-Optical line interface modules to improve the way operators monitor and react to fiber degradation or faults in the network. As a fiber span is turned up, it automatically runs an OTDR trace and sets this as the baseline. Specifically for Raman links, the Raman pumps are prevented from turning on until PinPoint OTDR ensures acceptable fiber plant conditions are met. This controlled turn-up process prevents connector, equipment, and fiber damage, which otherwise would cause additional deployment delays and cost.

During system operation, PinPoint OTDR identifies and localizes high connector losses or reflections and ensures the fiber plant is conditioned for optimal performance. In the event of a fiber cut, it will automatically initiate an OTDR trace. The generated trace is available to any user seconds after the fault is experienced, enabling the Network Operations Center (NOC) to precisely pinpoint the fault location and quickly take action. This capability eliminates the traditional lengthy troubleshooting step of sending technicians with test sets to either end of the failed span to localize the failure.

## Features and Benefits

- Provides automated scan of fiber plant at turn-up and during faults
- Pinpoints high losses or reflections in seconds, enabling quick troubleshooting and repair
- Allows for proactive monitoring and maintenance by identifying potential fiber issues, avoiding future outages
- Ensures fiber plant is conditioned for optimal performance
- Allows multiple fiber plant maps to be imported, correlating placemarks with network elements



PinPoint  
OTDR

Transform your photonic network operations with Ciena's Liquid Spectrum Analytics Apps [Learn more](#)



Instead, the technician is dispatched to the precise fault location to promptly execute the repair. This quick turnaround results in increased network availability and reduced outage times.

Another important benefit of PinPoint OTDR is that operators can compare OTDR traces over time. The original baseline trace can be used to compare new traces post-failure to validate that the fiber repair has been properly completed.

Previously, operators had to place links out of service if they wanted to run an OTDR trace. Enabling new levels of proactive fiber monitoring and maintenance, PinPoint OTDR uniquely allows operators to run OTDR traces over in-service links, with no impact to traffic. The user can leverage this powerful tool to proactively check for fiber degrades or bad repairs. It immediately identifies potential fiber issues, giving operators the ability to quickly attend to these and avoid future outages.

## Integrated User Interface

Integrated within MCP's user interface, the PinPoint OTDR application consolidates all fiber plant data in a single repository. Operators are able to plot network fiber plant and OTDR measurements onto a geographical map, all with a few simple button clicks! Network technicians can use the valuable GUI to understand the exact status of their fiber plant, with GPS coordinates pinpointing the exact location of faults. The easy-to-use GUI allows operators to zoom from a complete network view to a very detailed street-level map; users can select the specific point they want to view.

Providing full monitoring of the fiber plant, PinPoint OTDR allows users to initiate in-service OTDR traces and can quickly access the traces, identify any bad splice or high reflection point, and drive directly to the site of interest to take appropriate action.

With Liquid Spectrum's PinPoint OTDR, operators have a single, easily accessible, consolidated repository for all fiber plant data, with information at their fingertips to quickly address any current fiber issues or any disturbing degradation trends and ensure maximum network performance and service availability.

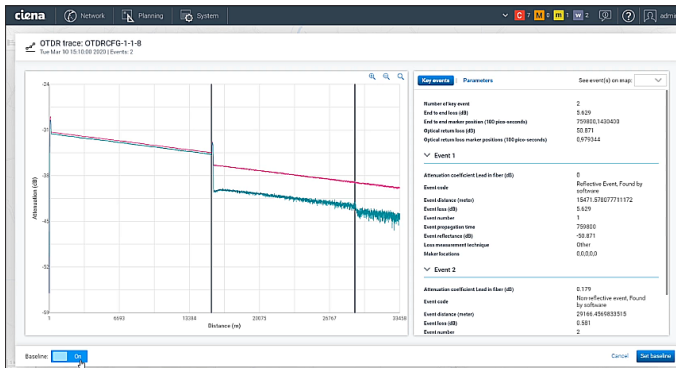


Figure 1. MCP's OTDR Trace viewer allows baseline traces to be set for comparison

Ciena's MCP domain controller [Learn more](#)

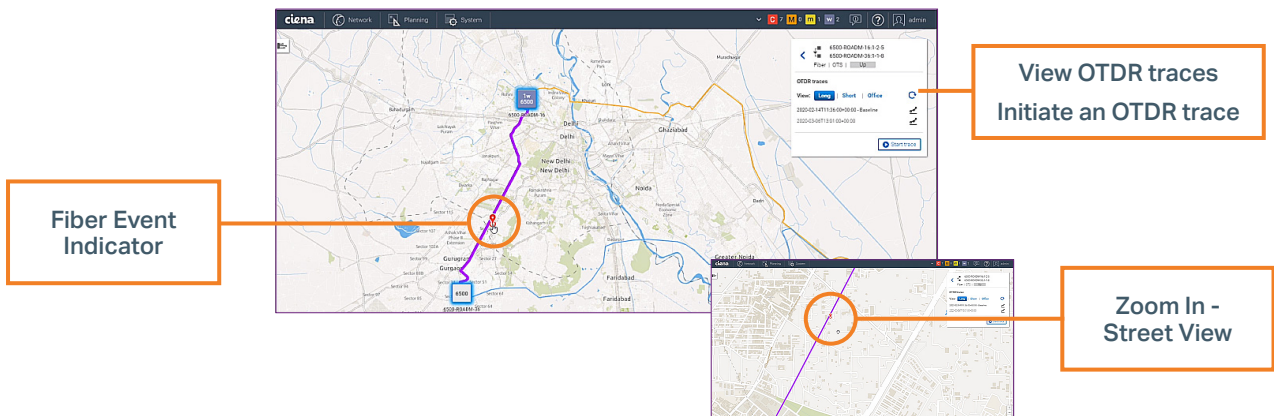


Figure 2. Events can be pinpointed to specific street locations

## Technical Information

PinPoint OTDR Capabilities	6500 S/D-Series ESAM	6500 S/D-Series SRA	6500 T-Series RLA	6500 RLS
OTDR wavelength	1527.22nm		1527.22nm (for counter-propagating traces), 1625nm (for co-propagating traces)	1625nm
Trigger for automatic OTDR trace	<ul style="list-style-type: none"> <li>• Circuit pack power-up</li> <li>• Optical line fiber cut</li> <li>• Once fiber cut has been repaired and re-spliced</li> </ul>	<ul style="list-style-type: none"> <li>• At turn-up: OTDR used by software to decide on GO/NO GO to turn on Raman pumps; GO/NO GO thresholds are user-provisionable</li> <li>• Optical line fiber cut</li> <li>• Once fiber has been repaired and re-spliced</li> </ul>	<ul style="list-style-type: none"> <li>• Circuit pack power-up</li> <li>• Optical line fiber cut</li> <li>• Once fiber cut has been repaired and re-spliced</li> </ul>	<ul style="list-style-type: none"> <li>• At turn-up: OTDR used by software to decide on GO/NO GO to turn on Raman pumps</li> <li>• Circuit pack power up</li> <li>• Optical line fiber cut</li> <li>• Once fiber has been repaired and re-spliced</li> </ul>
In-service OTDR use cases	<ul style="list-style-type: none"> <li>• To locate fiber pinch location</li> <li>• To locate span loss changes</li> <li>• To locate reflective events</li> </ul>	<ul style="list-style-type: none"> <li>• To locate fiber pinch location</li> </ul>	<ul style="list-style-type: none"> <li>• To locate fiber pinch location</li> <li>• To locate span loss changes</li> <li>• To locate reflective events</li> </ul>	<ul style="list-style-type: none"> <li>• To locate a fiber pinch location</li> <li>• To locate span loss changes</li> <li>• To locate reflective events</li> <li>• To detect changes in Mode Field Diameter to measure "true loss" of splices and connectors with different fiber types.</li> </ul>
Automatic OTDR Trace	Three traces are run in each instance (Office, Short and Long)			
Standards compliance	Telcordia GR-196			
OTDR trace file format	'SOR' file format defined in Telcordia SR-4731 Issue.2 OTDR Data format			
PinPoint OTDR application	Imports all fiber plant data from KML based files Ability to launch OTDR trace from fiber map GUI pinpoints failures to the street level			

OTDR Trace Parameters	Very High-resolution (Office Trace)	High-resolution (Short Trace)	Low-resolution (Long Trace)
Purpose	Detection of reflections at the faceplate	Detection of back reflections close to the Tx launch point, including faceplate connector	Measure fiber losses over the entire span
Launch power	4dBm (peak)		
Target range	2km	20km	80km Open connector: up to 120km
Pulse width	10nsec, 30nsec, 100nsec Default: 100nsec	Default: 1usec	3usec, 10usec, 40usec Default: 40usec
Distance Accuracy	2m	4m	15m
Event dead zone	50m	100m	4km
Acquisition time	10sec - 120sec Default: 60sec		

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