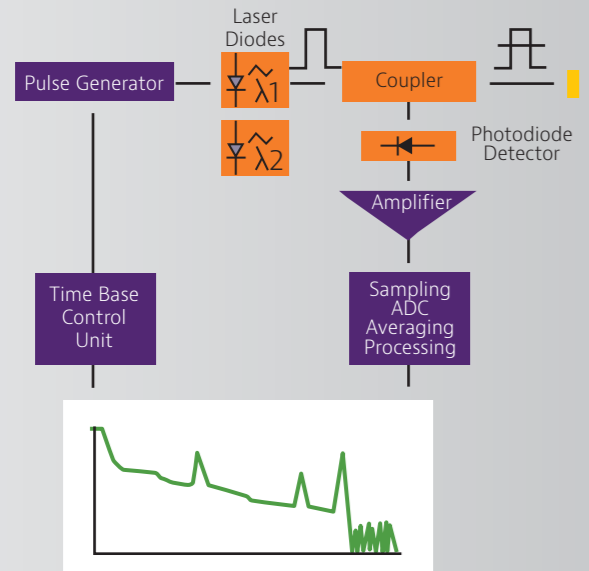


# Understanding Optical Time Domain Reflectometry



## OTDR Block Diagram

The optical time domain reflectometer (OTDR) injects an optical pulse into one end of the fiber and analyzes the returning backscattered and reflected signal.



An operator at one end of a fiber span can measure and localize attenuation, event loss, reflectance, and ORL.

A schematic diagram showing OTDR technology

## What Does an OTDR Measure?

An OTDR detects, locates, and measures events on fiber links, requiring access to only one end of the fiber.

**Attenuation** (also called fiber loss)  
Expressed in dB or dB/km, attenuation represents the loss or the rate of loss between two points along the fiber span.

**Event Loss**  
The difference in the optical power level before and after an event, expressed in dB.

**Reflectance**  
The ratio of reflected power to incident power of an event, expressed as a negative dB value.

**Optical Return Loss (ORL)**  
The ratio of the reflected power to the incident power from a fiber optic link or system, expressed as a positive dB value.

## How to Configure the Main OTDR Settings

**Pulse Width**  
The pulse width controls the amount of light injected into a fiber.

A short pulse width enables high resolution and short dead zones but less dynamic range.

A long pulse width enables high dynamic range but less resolution and large dead zones.

**Acquisition Time**  
The time during which the OTDR acquires and averages data points from the fiber under test. Increasing the acquisition time improves the dynamic range without affecting resolution or dead zones.

**Index of Refraction (IOR)**  
The IOR converts the time that the OTDR measures to distance and displays it on the trace.

Entering the appropriate value for the fiber under test will ensure accurate measurements of fiber length.

**To obtain accurate measurements, always clean connectors prior to OTDR testing!**

