FIBER OPTIC FIELD GUIDE

Fiber Deployment Analysis simplified. This tool automates that work.

Every fiber build produces a mountain of test files, and someone has to turn them into a report the network owner will sign off on. For years that someone was me, by hand. I built a tool that automates that work.

Johnstone Technical Services · https://johnstonetechs.com/guides/fiber-analysis-tool

Every long-haul fiber build produces a mountain of test files. OTDR traces at multiple wavelengths, both directions, dozens or hundreds of spans. OLTS tables. Fiber inspection reports. Every crew names their files a little differently. Every OTDR brand exports a little differently. Every project manager wants the same information in a slightly different format.

Somebody has to sort through all of it. Standardize the naming. Fix the identifiers. Check what passes and what doesn't. Catch the errors before they turn into wasted truck rolls. Write it up in plain language a network owner will sign off on.

That's the job of a fiber analyst.

What fiber optic test analysis covers

Fiber optic test analysis is how you prove a link is good: its physical integrity, how much signal it loses, and where any fault sits. On a real build it runs in two tiers, straight out of ANSI/TIA-568.3-D.

Tier 1 (certification) uses an OLTS, an optical light source and power meter, to measure the whole link end to end: total insertion loss, length, and polarity. That's the pass/fail number the network owner signs off on.

Tier 2 (characterization) adds an OTDR, which fires pulses down the fiber and reads the backscatter to map every event along the route. Each connector, splice, and bend shows up with its own loss and reflectance, and the distance to it. That's how you find the one bad connector instead of just knowing the link failed.

The numbers that decide pass or fail:

- Insertion loss (IL): total power lost from source to receiver, in dB. Lower is better.
- Optical return loss (ORL): how much light reflects back toward the source, in dB. Higher is better.
- Attenuation: loss per unit length, in dB/km, as light travels the fiber core.
- Event analysis: the reflective and non-reflective events on an OTDR trace, connectors, fusion splices, micro-bends, and breaks.

Running that analysis across a whole job, both directions, multiple wavelengths, OLTS and OTDR files from different crews and instruments, is the slow part. That's what this tool automates.

What the job actually looks like

If you've done acceptance or deployment analysis on any real build, you know what I'm about to describe. If you're new to it, this is what the manual version of the work looks like.

You get a folder. Or 20 folders. Or a shared drive nobody has bothered to organize. Inside are files named things like Trace 001.sor, SITE_A_TO_B_1310.trc, field_measurement_final_v3(2).sor, and IMG_20240815_143022.jpg. Some are duplicates. Some are wrong wavelength. Some are from the wrong span entirely. A few have vendor-specific quirks that don't open cleanly in another vendor's software.

Your job is to turn that into a package the network owner will sign off on. Clean naming. Standard identifiers. Consistent structure. A report that reads like a professional wrote it and not a script.

The manual version of this workflow takes hours per project. Multiply by every project a contractor does in a year, and you understand why good deployment work often looks sloppy in the paperwork.

What the tool does

Drop a job's test files onto /analysis. Files, folders, or a .zip of the whole job. Duplicates and messy names are fine. The tool starts analyzing on drop. You can add more files later and they join the same job.

You get back three things:

One repair verdict per fiber. Every fiber in the job gets a row showing pass or fail, span length, total loss, worst reflectance, and any high-loss events. If the tool catches a mismatch between the filename and the file's internal ID, it flags it and offers to update the identifier. Here's the real per-fiber table from the built-in sample job:

An actionable repair summary. One line per fiber, plain language, ready to copy or export as CSV. Something like:

ALPH-BRVO-L-S F077 — Traces reviewed: 162.149 km span, 32.54 dB total loss, worst reflectance -31.81 dB. High-loss events: 19.513 dB splitter at 19621.020 km, 14.649 dB connector at 16444.819 km, 14.649 dB connector at 24049.409 km. Review recommended.

An AI review of the whole job. Overall assessment, patterns across fibers, dispatch priorities, and things worth a second look. Generated by an AI prompted to write the way a deployment analyst does.

Everything exports to PDF. Everything runs entirely in your browser. Files never leave your device.