FIBER OPTIC FIELD GUIDE

How to calculate a link loss budget

How do you do your math? Spreadsheet? App? Napkin? Whatever works — what matters is the answer it gives you about whether your trouble is real, or whether engineering boinked it before it hit the field.

Johnstone Technical Services · https://johnstonetechs.com/guides/link-loss

I did the math by hand with a cable bible and a notebook. The equation is pretty straight forward Input Level minus (Length Loss + Connector Loss + Splice Loss + Splitters + anything else) equals expected level. Worked for coax. Works for fiber. Nothing groundbreaking. Jump to the calculator below if you'd rather just run the numbers.

As my career progressed and I started building tools for the workforce, I put together a simple Google Sheet that worked offline. Straight to the point. Fill in the values, get the result.

Why this math matters in the field

Most techs I trained were confused about what they should see at the terminal. Once they saw the link loss budget worked out on paper, it all clicked.

- If the input level is low, the terminal level is going to be low. That alone saves hours of hunt-and-peck troubleshooting.
- If a mated pair measures more than 0.5dB, you know exactly where the problem is.
- If the designed level is OOS (out-of-spec), you don't stand a chance of getting correct levels at the terminal. You can troubleshoot and re-splice all day. Nothing is going to fix bad design.

One sheet of math tells you all of this. It tells you whether your trouble is real or whether you're chasing a problem the design baked in before anyone touched the fiber. Jump to the calculator below and try it against a span you know.

Loss Calculator

The same calculator that lives at /loss is embedded right here. Inputs are pre-filled with the example from my original spreadsheet — change them to your span and watch the numbers track. All the math runs in your browser, so once the page is loaded it keeps working offline — useful when you're in a vault with no signal.

A short walkthrough of the calculator below.

Free in your browser: OTDR trace analyzer, splice matrix builder, fiber analysis, link loss calculator, and more at johnstonetechs.com. Informational guidance; verify critical measurements against certified test equipment.