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Applications Engineering Note

Estimating Cable Length with OTDR

AEN 142, Revision 1

This Applications Engineering Note (AE Note) addresses estimating cable length or event distance using an optical time domain reflectometer (OTDR). This AE Note does not provide operating instructions for any particular OTDR. Contact the equipment supplier for unit-specific instructions or training.

Calculating Distance Using OTDR Measurements

In most outside plant cables (and some indoor cables), fiber length exceeds cable length. In stranded loose tube designs, this excess fiber length (EFL) is typically 2-3%. In central tube cables, the EFL is typically zero to a fraction of 1%. In many cases, estimating cable length (or distance to an event) requires determining a conversion factor.

Because manufacturers sometimes modify cable designs, determining a conversion factor is best accomplished by a field test. Simply divide marked cable length by measured fiber length by to a known event. Figure A depicts the technique.

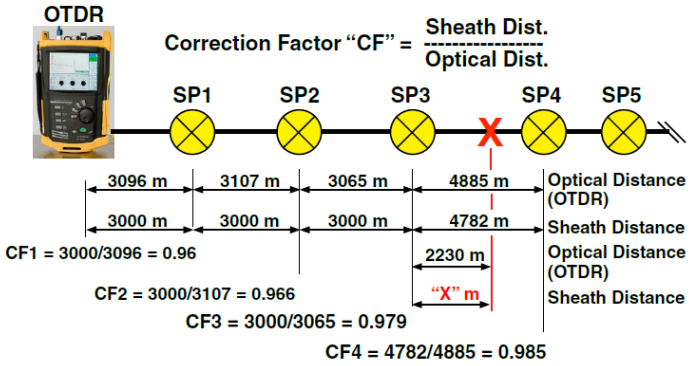

Figure A: Correction Factor Calculation

A correction factor is critical to accurately locating breaks or components in long-length systems. As Figure A shows, even a 1.5% correction can result in a substantial difference between fiber and cable length (~113 feet/ 34 meters in the example).

Additional Information

Direct questions to Corning Technical Support at 1-800-743-2671.

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