OTDR Dynamic Range explained

Questions when buying and OTDR

1.   SM and MM or just SM
2.   What wave lengths do you want to test, normally only up to 4 wave lengths are available in any one OTDR.
3.   What connector type, most SM OTDR specify SC/APC and MM SC/UPC
4.   How far do you want to see? The Dynamic range of an OTDR

This document is going to cover Dynamic Range and how to interoperate it into distance

Assume you have an OTDR with a the following specification 1310nm/38dB and 1550nm/35dB Dynamic range

With formula below:

Fibre length = [(loss at the wave length used) - (link loss)] / [fibre loss(dB/km)]

= [(optical budget) - (splice loss + connector loss + noise)] / [fibre loss(dB/km)]

        Assume Fibre attenuation at 1310 and 1550 as per below
- 1310nm loss per 1000m @ 0.35 dB
- 1550nm loss per 1000m @ 0.21 dB
    Assume you have 5 splices at 0.1 dB each and 2 connectors @ 0.75dbB each
    Assume a noise level of about 5dB

1310nm distance calculation

Fibre length = {38dB - [(0.1dBx5)+(0.75dBx2)+5dB} / (0.35dB/km)

= {38 - [0.5+1.5+5]} / 0.35

= (38 - 7) / 0.35

= 88.57 km this is the distance the OTDR could see @1310nm in these perfect conditions

1550nm distance calculation

Fibre length = {35dB - [(0.1dBx5)+(0.75dBx2)+5dB} / (0.21dB/km)

= {35 - [0.5+1.5+5]} / 0.21

= (35 - 7) / 0.21

= 133.33 km this is the distance the OTDR could see @1550nm in these perfect conditions

Note that in an existing network, the cable may have more loss, because of its age, and of course the more splicers and connectors in the network will add additional attenuation and thus make the measurable distance shorter.

Please contact atg for more detail and delivery times