

OIN-0710 How to test PONs

Passive Optical Networks involving fibre splitters are not easy to test. The methods that have been developed have limitations because of the nature of the network.

- (1) Insertion Loss testing between the central office and the customer end (or cabinet end). Return Loss may also be tested if this is a requirement.
- (2) OTDR test from customer premises (or cabinet) back towards the splitter. The trace will show a large drop at the splitter. Tests can be carried out at the appropriate wavelengths. Typically the PON transmission wavelengths are 1310, 1490 and 1550nm. These can be used for testing during commissioning. 780 or 1625 or 1650nm can be used for testing out of band.
- (3) OTDR testing from the Central Office end through the splitter may also be carried out. A large loss is seen at the splitter position followed by multiple end reflections, one for each leg of the splitter, e.g. 32. It is difficult to identify which reflection corresponds to a particular customer end and if any fibre legs are similar in length, the reflection peaks will coincide. Putting the OTDR into real-time mode and adding a temporary extension cable to a fibre end can help in resolving the fibre end by observing the movement of the peak. An OTDR with a high dynamic range at small pulse width is required for this type of testing.

