

Calculation of pigtails in secondary optical splitter

Article Overview

The number of pigtails in a secondary optical splitter depends on the splitter ratio, the number of cascaded stages, and the deployment architecture.

Understanding Pigtails and Splitters

A fiber optic pigtail is a short fiber with a factory-terminated connector on one end and bare fiber on the other, designed for fusion splicing into the main fiber network. In a secondary optical splitter, pigtails are used to connect the splitter outputs to subscriber fibers or patch panels. Each output port of the splitter requires one pigtail, and the input port also typically uses a pigtail to connect to the upstream fiber.

Calculating Pigtails for a Single Splitter

For a 1xN splitter:

- o Number of output pigtails = N
- o Number of input pigtails = 1
- o Total pigtails = N + 1 For example, a 1x16 splitter requires 16 output pigtails plus 1 input pigtail, totaling 17 pigtails.

Cascaded Splitter Configurations

In cascaded or distributed splitting, multiple splitters are combined to achieve higher split ratios. For instance, a 1x32 split can be achieved using a 1x4 splitter followed by two 1x8 splitters. The pigtail calculation in cascaded setups is as follows:

- o First stage splitter: 1 input pigtail + 4 output pigtails = 5 pigtails
- o Second stage splitters: Each 1x8 splitter has 1 input pigtail (spliced from first stage output) + 8 output pigtails. With 4 outputs from the first stage, you need 4 x 1x8 splitters:
 - o Input pigtails for second stage = 4 (spliced from first stage outputs)
 - o Output pigtails = 4 x 8 = 32
- o Total pigtails = 5 (first stage) + 32 (second stage outputs) = 37 pigtails Note that the input pigtails of the second stage are typically spliced to the first stage outputs, so they may not require additional factory-terminated pigtails if splicing is used.

Centralized vs. Distributed Architectures

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- o Centralized splitters: All splitters are located in one cabinet or ODF. Pigtails are easier to manage, and jumper flexibility allows reassignment of subscribers without additional pigtails .
- o Distributed splitters: Splitters are placed closer to subscribers in closures or pedestals. Each splitter output requires a pigtail to connect to the subscriber fiber, increasing the total number of pigtails needed .

Practical Considerations

- o Always account for splice loss (typically 0.3 dB per splice) and connector loss (0.3-0.75 dB per mated pair) when planning optical budgets .
- o Use factory-terminated pigtails to ensure low insertion loss and high return loss, improving network reliability .
- o For large deployments, consider PLC splitters for uniform power distribution and predictable loss characteristics . By following these principles, network engineers can accurately calculate the number of pigtails required for secondary optical splitters, optimize deployment costs, and maintain high network performance.

FiberSavvy: Fiber-Optic Pigtails: This article delves into the different characteristics and

Confused about fiber optic pigtails--which connector type, which polish, fusion or

As an expert in fiber optic technology at SDGI Cable, we highlight the importance of precision when designing an

Understanding Optical Splitter loss ratios and insertion loss is fundamental to building a reliable fibre optic network.

Fiber optic pigtails provide an optimal solution for joining optical fibers, particularly in 99% of

In this guide, we will break down what fiber optic pigtails are, how they differ from patch cords, what types exist, and

Optical splitters are usually used in passive optical networks (PONs) to distribute fiber to individual homes or

Learn more about fiber optic pigtails and how they can help you build a reliable and secure fiber optic network.

This guide focuses on two critical aspects of optical splitters that define FTTH performance: split ratios (how signals

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To truly understand the capability of the SC/UPC 1×16 Pigtail type fiber splitter, one must look into the microscopic

Learn how to calculate the optical loss and budget of fiber optic splitters in FTTH using a simple formula. Compare FBT and PLC

For every 2X increase in split ratio, power is reduced by roughly 3 dB. In most cases, the power out of each leg is equal, but we'll

The splitting loss is actually caused by the transfer of optical power during splitting, not the consumption of optical

Measure the optical power at both the input and output ports of the splitter. Calculate the

Optical splitters are vital in FTTH PON systems, distributing a single signal efficiently. Key parameters, Split Ratio and

For other 1xN optical splitters, such as 1x32 optical splitters, the above measurement method can also be used, we

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