

## Network Critical Fiber Split Ratio and Cable Length Reference Chart

(Please note that these figures are guidelines only and that the db loss can vary from installation to installation!)

### What is a Split Ratio?

A split ratio is the amount of light that is re-directed from the network to the monitor ports. To determine the correct split ratio, a Loss (power) Budget should be calculated. In order to take an exact copy of the traffic passing through an optical tap the fiber is physically spliced with another fiber to make a Y shape. The light energy is split in two and travels along each arm of the Y, one going to the live port and one to the monitor port. The split ratio indicates what percentage of the light energy goes to the each port. In a 50:50 tap the split is equal, whereas in a 70:30 tap 70% goes to the live port and 30% to the monitor port.

- **50/50 split ratio is standard for enterprise applications**

### What is a Loss (power) Budget and how do I calculate this?

A Loss (power) Budget is the amount of attenuation that can be tolerated on the network and monitor links before the end to end data is corrupted. To calculate this, one must know the following network link characteristics: Link Distance, Fiber Type, Launch Power, Receiver Sensitivity, number of interconnects and splices.

### What Split Ratios are available from Network Critical?

Network Critical's standard Fiber TAPs are available with the following Split Ratios: 50/50 & 70/30.

- Custom orders can be done to accommodate 60/40, 80/20 & 90/10 split ratios

This is a table listing the dB loss you can expect through each tap. You should calculate the loss of a system without the tap, and then see which splits will fit and give you the least acceptable loss.

Split Ratio	Live Port	Mon Port
50:50	4.5	4.5
60:40	3.1	5.1
70:30	2.4	8.3
80:20	1.8	8.1
90:10	1.0	11.5

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80:20 | 1.8 | 8.1

90:10 | 1.0 | 11.5

Sample Network Critical Split Ratio Calculation based on GigaBit Multimode, 62.5/125 μm, 850nm wavelength

1. Calculate the Power Link Loss Budget (receiver sensitivity - transmit output power):

$$(-17\text{dB}) - (-9.5\text{dB}) = -7.5\text{dB}$$

2. Calculate the Total Cable Attenuation (Sum of Connection Losses) + (Sum of Distance Losses):

$$(-0.5\text{dB}) + (-0.5\text{dB}) = -1.0\text{dB}$$

3. Calculate the Total Coupler Loss Allowed (Sum of Power Link Loss Budget) - (Total Cable Attenuation):

$$(-7.5\text{dB}) - (-1.0\text{dB}) = -6.5\text{dB Budget Window}$$

4. Split Ratios with the Network Port Loss and Monitor Port Loss less than the total coupler loss allowed for these respective connections are viable. The optimal Split Ratio is one that maximizes the network signal.

**Gigabit Multimode Fiber Tap Specs:**

Max Distance: 220 meters @ 62.5/125µm, 850nm wavelength / 550 meters @ 50/125 µm, 850 wavelength

Split Ratio Network Port IL Monitor Port IL Network Distance 62.5/125µm 50 Micron Distance

50/50 < 4.5 dB < 4.5 dB 1-44 meters 1-110 meters  
 60/40 < 3.1 dB < 5.1 dB 44-88 meters 110-220 meters  
 70/30 < 2.4 dB < 6.3 dB 88-132 meters 220-330 meters  
 80/20 < 1.8 dB < 8.1 dB 132-176 meters 330-440 meters  
 90/10 < 1.3 dB < 11.5 dB 176-220 meters 440-550 meters

**Gigabit Single mode Fiber Tap Specs:**

Max Distance: 5 Km, 8.5/125µm, 1310nm wavelength

Split Ratio Network Port IL Monitor Port IL Network Distance

50/50 < 3.7 dB < 3.7 dB 0-1 Km  
 60/40 < 2.8 dB < 4.8 dB 1-2 Km  
 70/30 < 2.0 dB < 6.1 dB 2-3 Km  
 80/20 < 1.3 dB < 8.0 dB 3-4 Km  
 90/10 < 0.8 dB < 12.0 dB 4-5 Km

**Indicated Maximum Monitoring Cable Distance for All Optical:**

Split Ratio Multimode 62.5/125µm Multimode 50/125µm Singlemode 8.5/125µm

50/50 1-44 meters 1-110 meters 0-1 Km  
 60/40 1-28 meters 1- 75 meters 0-750 meters  
 70/30 1-23 meters 1- 58 meters 0-540 meters  
 80/20 1-17 meters 1- 44 meters 0-350 meters  
 90/10 1-12 meters 1- 31 meters 0-210 meters

**Indicated Maximum Monitoring Cable Distance for 100/1000Mb:**

1-80 meters

(Please note that these figures are guidelines only and that the monitoring cable distance can vary from installation to installation!)