

Application Note

1G PON Measurements Using the OWS203

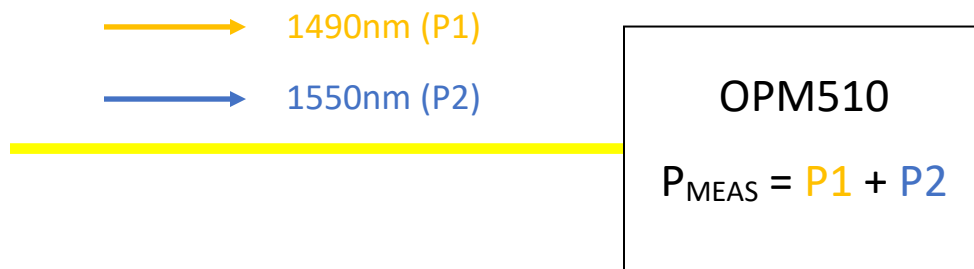
Introduction

1G PON has been installed for well over 10 years and the only way that the data at 1490nm and the video overlay at 1550nm optical signal levels can be measured is to use an expensive PON OPM or DWDM OPM. The OWS203 is a device that separates the two downstream wavelengths 1490nm and 1550nm used in 1G PON installations and provides a much more cost-effective solution when used in tandem with a basic OPM such as the OPM510. The OWS203 can be used on all 1G PON installations.

Measuring Using a Basic OPM

If a basic OPM is used to measure the combined signals of 1490nm and 1550nm the total power will be measured with no individual wavelengths power being measured. The total power measured is the summation of the power of all wavelengths.

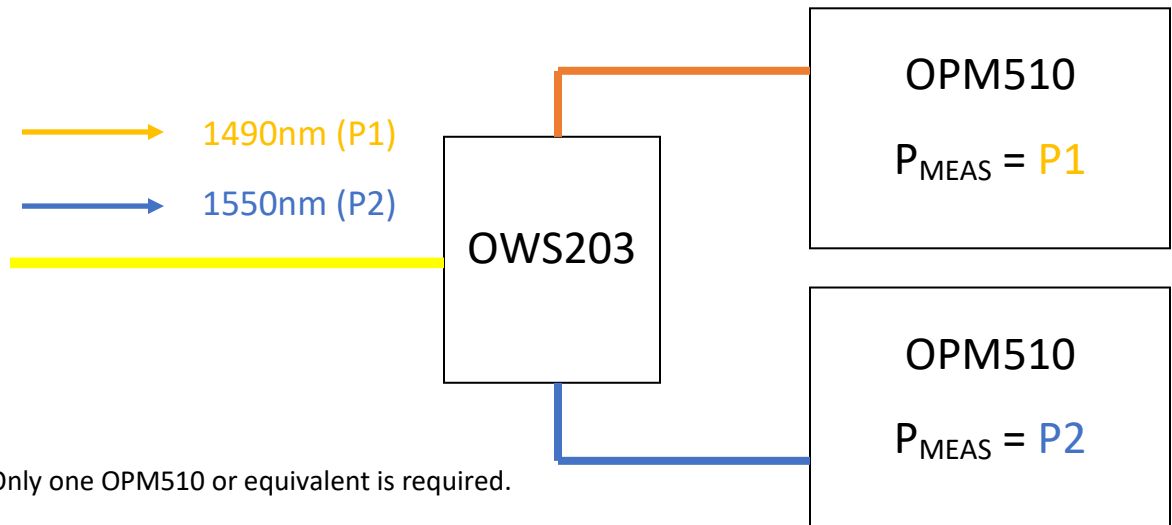
Typical power levels in a GPON network:
1490nm (Data) = -17dBm (20 μ W; 0.02mW)
1550nm (Video) = 0dBm (1mW)
 $P_{MEAS} = +0.086dB$ (1.02mW)



As you can see the technician would never be able to tell if the data signal was present or not since it is so much smaller than the video overlay signal.

Measuring Using the OWS203 with a OPM510

The optical power of the data (1490nm) and video overlay (1550nm) can be measured without influence from each other when the OWS203 is used to separate the two signals.



Note: Only one OPM510 or equivalent is required.

P1 would be measured at -17dBm and P2 would be measured to be 0dBm. The technician can now measure each signal with certainty and no influence from the adjacent wavelength.

Conclusion

When the OWS203 is used the technician is able to separate the data and video signals into two fibers so that the exact power level can be measured without influence from the other wavelength. This is especially useful when measuring signals that are of vastly different intensity such as where the video signal is much larger than the data signal in 1G PON installations.

The OWS203 when used with a standard OPM allows the technician to measure optical power in 1G PON installations without having to buy an expensive PON or DWDM OPM.