

Swept Wavelength Testing:

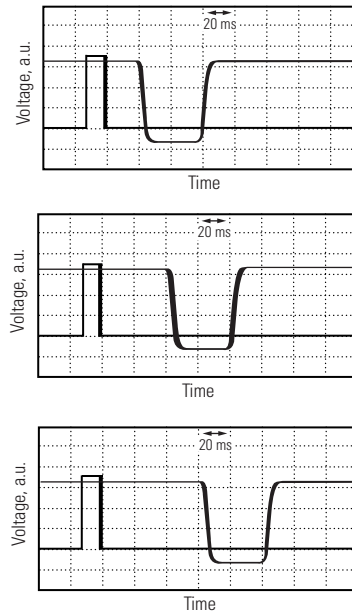
Real-Time Wavelength Trimming of WDM Muxes

For applications requiring fast wavelength measurements and high resolution, the Vidia-Swept™ tunable laser from New Focus provides superior resolution, accuracy, and speed over traditional test methods.

Tunable lasers can easily provide the resolution desired for measuring narrow-band filters. However, the traditional “step & measure” technique is too slow to be used for real-time measurements such as setting the wavelength of filters while manufacturing WDM Mux components. Optical Spectrum Analyzers (OSAs) have provided the speed necessary for this application but, as the channel spacing decreases, the resolution of OSAs begin to seriously limit these measurements.

The Vidia-Swept tunable laser combines the speed of an OSA with the resolution of a laser. When used in place of an OSA for real-time wavelength trimming, the Vidia-Swept easily provides 1-pm resolution during a single scan. In addition, the laser’s patent-pending motor design delivers the scan linearity and trigger repeatability needed to get a calibrated picture of a particular device’s transmission in real time.

To demonstrate the effectiveness of the New Focus laser, we used it to monitor the wavelength of a fiber-Bragg grating as the grating was stretched. Three traces with the fiber-Bragg grating under different tensions are shown at right. Each trace contains >10 scans and shows the very high repeatability of both the trigger pulse (set to 1533.000 nm) and the laser scan. The



These plots show the wavelength changes of a fiber-Bragg grating under different tensions. The filter width was 400 pm and shifts equal to this are clearly seen under the different tensions. The programmable trigger pulse was set at 1533.000 nm. Each trace shows multiple laser scans and demonstrates the repeatability and stability of the laser scan and its patent-pending motor design. At a scan speed of 10 nm/sec, each trace above was acquired in < 0.5 sec.

laser was scanning at 10 nm/sec (it can go up to 100 nm/sec) so each trace above took <0.5 sec.

As this example illustrates, the New Focus Vidia-Swept combines the speed of an OSA and the resolution of a laser and can be used during manufacturing for real-time wavelength trimming of WDM components.

