Applications: Reducing Production Bottlenecks Using Real Time Laser Beam Measurements

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The 1780 ModeScan determines M^2 and other beam propagation parameters of a laser in real time. Traditionally, these measurements were performed by directing the laser beam through a lens and measuring the resulting beam waist caustic by moving a beam profiler system or internal mirrors along the beam path. A beam size measurement is acquired at each profiler or mirror location. It normally takes 30 seconds to a few minutes to generate results in this manner. This also requires and moving parts within the M^2 measurement system that will wear down over time.

The 1780 ModeScan system gets around these problems by using partially reflective optics to pick of the beam in 10 locations along the beam waist caustic and directs the 10 beams onto a single silicon CCD array. Thus, all ten beams are measured simultaneously, so parameters such as M^2 or beam astigmatism is calculated about 15 times a second. Not only our results obtained much quicker than with conventional equipment, beam propagation parameters that used to take minutes to acquire can now be used as a feedback parameter for active alignment.

One customer recently invested in the 1780 ModeScan sytem to significantly reduce a production bottleneck. They had an Ophir M2-200S system and were pleased with the accuracy of the results. However, when they used the M2-200S system to align an optic to correct for astigmatism in their laser they had to wait several minutes at each alignment interaction of this optic to determine for the M2-200S system to determine the effect of the new lens position on laser astigmatism. It normally took an entire afternoon to align the optic to ensure it was removing enough astigmatism in their laser beam to satisfy their customer.

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With a 1780 ModeScan system, they could look at the astigmatism of their beam is real time. And so with real-time feedback from their 1780 ModeScan, need only five minutes to perform the astigmatism lens alignment that previously took half a day. They still use their Ophir M2-200S system for final test of each of their lasers, as it is still the most accepted instrument in the industry for M^2 and other beam propagation results.

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