Application note:

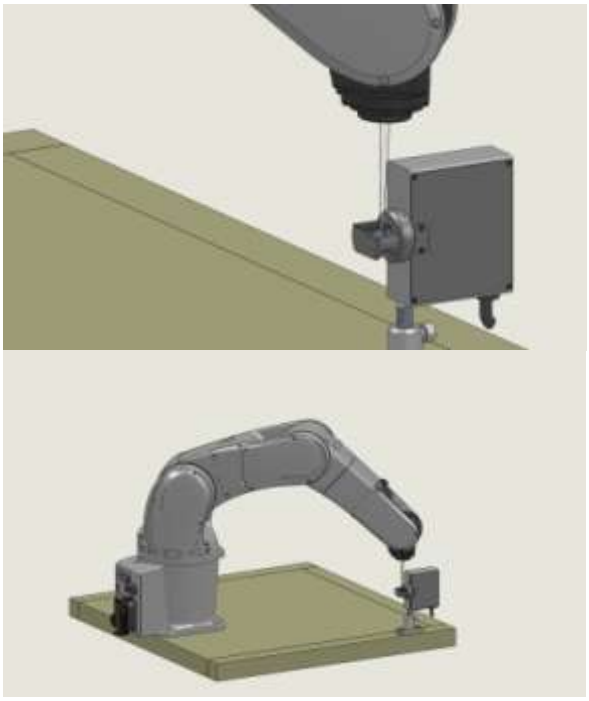
High power Laser Beam Profiling

In today's engineering world many new applications of material processing using lasers have emerged. In particular fiber laser technology has made a dramatic progress in output power and beam quality. Kilowatts of power have been demonstrated and implemented for various applications such as cutting, welding, ablating and others. The advantages of fiber lasers are their high power mechanical stability and good beam quality; however beam quality and beam profile has to be periodically checked.

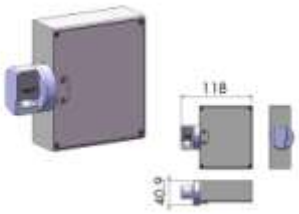
In general, there are many difficulties in checking beam quality especially at the focal point, where densities will exceed 50KWatt per square cm. On one hand those energies are capable to melt and destroy most known materials, while on the other hand measuring a focused profile is the most significant measurement.

Recent development has been made in the area of accurate beam sampling, distortion free. A carefully designed Beam Sampler such as the one offered by Duma Optronics can sample about **1/100000** without distortion, while preserving the original beam polarization. Picture 1 shows a typical application of a laser welding line used on the Automotive industries.

SAM3 attachment can be used with the following measuring heads: BeamOn, Beam Analyzer, BeamOn HR, µBeam, SpotOn CCD. See configuration of SAM3 with Beam Analyzer measuring head in picture 2.



Picture 1: Knife-Edge beam analyzer with a beam sampler for high power laser measurements (up to 1.5kW)



Picture 2: Configuration of SAM3 on Beam Analyzer. (Dimensions are in mm)

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