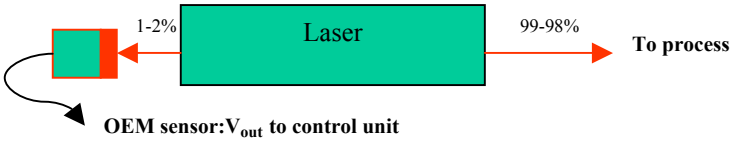
Applications of OEM Sensors & Heads

A-Thermal Sensor Disc and Heads

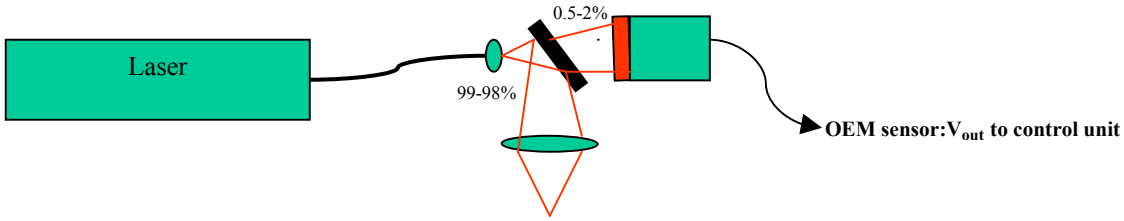
Laser source monitoring

This is by far the most popular application of OEM heads. They are placed behind laser rear mirrors and catch the <1-2% radiation leaks exiting from these mirrors; that amount is strictly proportional to the total emitted power so its measurement results to be very reliable. Given the small leakage fraction, multi-kilowatts sources can be continuously monitored by low power sensors. Though the final validation of a laser source, including the calibration of its internal power sensor, is made by a power meter, yet OEM sensors provide successive field monitoring, are used for later alignment purposes and setting of process parameters.



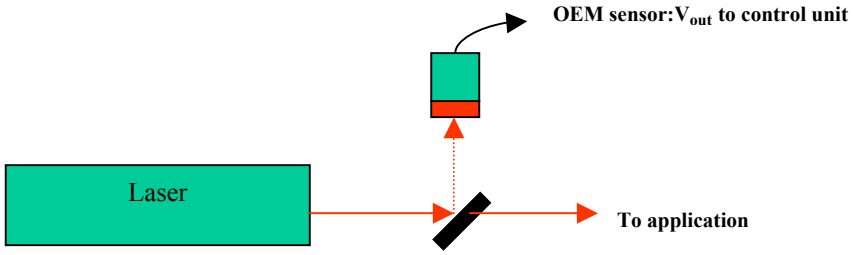
Fiber monitoring

Monitoring the integrity of fibers delivering Nd-Yag, Diode laser, medical lasers beams, either at high powers or low powers, can be done by picking up the residual beam portion (< 0.5-2%) non reflected by the total 90° mirror in the focusing heads.



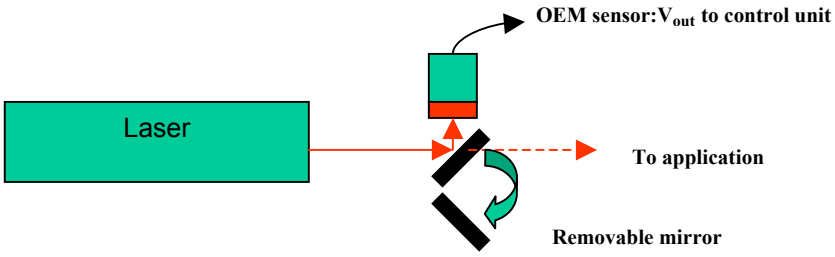
On-line monitoring

On-line monitoring can be easily achieved by exploiting the leaks of existing optical elements or keeping dedicated components (like beam splitters, filters, diffractive optics, etc) into the beam path.

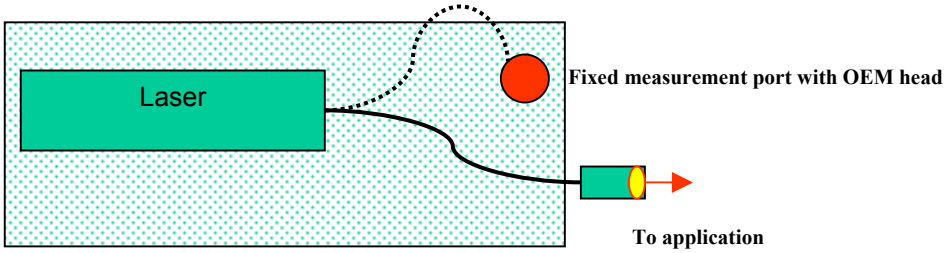


Beam dump

In some medical applications the laser must be kept running at its working power or energy even when it is not in use for treatment. The necessary power/energy must be immediately available for the short periods of application and there must be no delays (e.g. warm-up times). OEM heads are used as beam dumps for the non-operating periods and an extractable mirror releases the beam for the application.



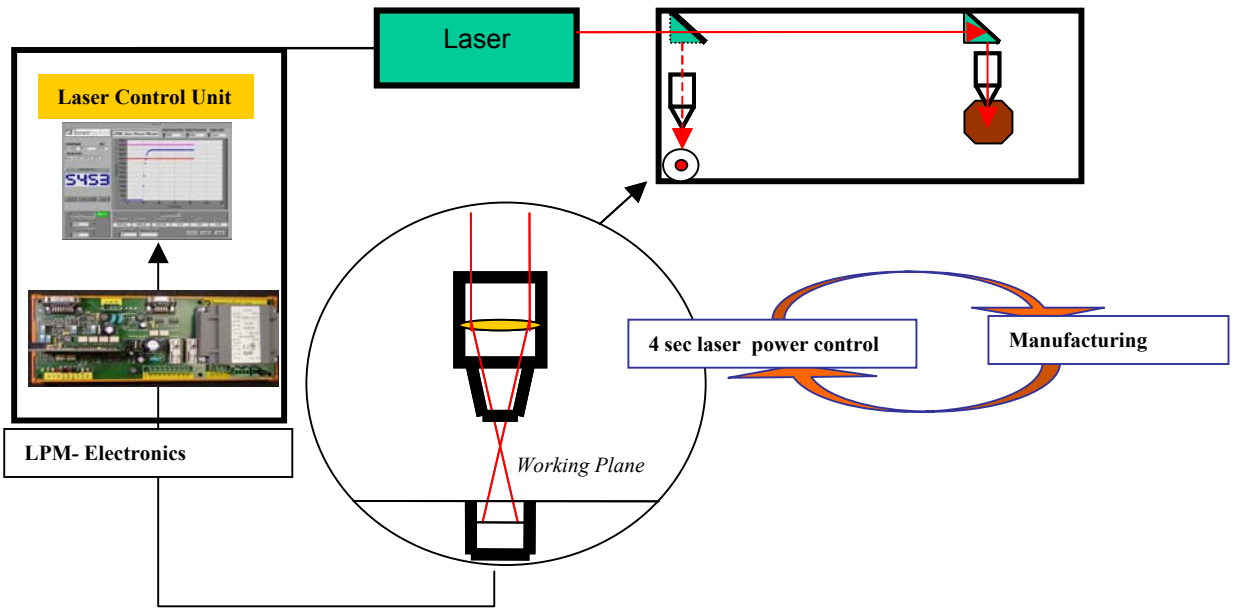
Sampling at measuring port
Several medical machines bear a port for time-to-time measurement of laser power or energy. In Countries like the US it is a precise requirement from FDA to have a monitor for each laser on-board the machine. OEM heads are plugged into the ports to read the power or energy available for treatment exiting, e.g. from optical fibers. Moreover, since optical fibers or fiber tips crack very easily, frequent checks are a wise solution.



B-OEM Laser Probes

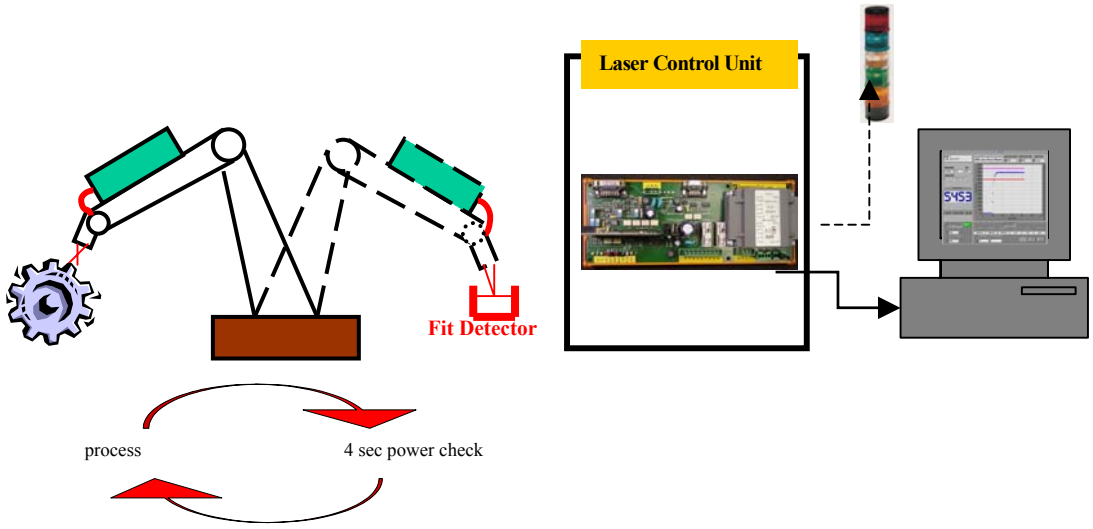
Operation in the Probe Mode (periodic power check) Measurements runs can be planned to accomplish short controls of beam power during working cycles, after laser parameter resetting, optics realignment, etc. The use of special FIT (Fast Integrating Thermopile) heads, which do not require any water cooling even at several KWs, is of great help in many industrial environments where having water at the application area is a problem. The OEM laser probes are perfecy for use with the LPM electronics whose acquisition and processing board can be plugged on any standard DIN rail and housed in industrial cabinet or rack. Data can be analysed (3) by the specific SW for the Probe Mode or, should immediate any immediate warnings be needed, visible/ acoustic alarms can be triggered.

Periodic controls in manufacturing
Periodical monitoring and control of power in laser cutting or welding machines. The LPM software allows the setting of alarm thresholds for a GO/NO GO of manufacturing process



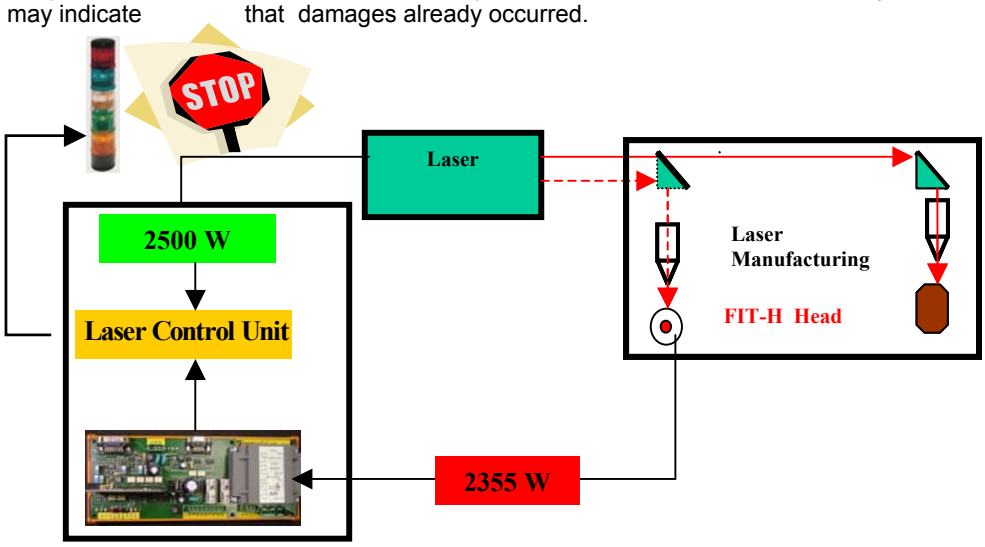
Systematic monitoring of process parameters

Periodical monitoring and control of constancy of power level in laser robot applications for total repeatability of process . The LPM allows the setting of alarm thresholds for a GO/NO GO of manufacturing process



Predictive Maintenance

Prediction of incoming failures ,e.g. at optical components, can be easily done by cross checking the power/energy delivered by the laser source and what is effectively delivered to the work piece. A too high difference between the two values may indicate that damages already occurred.



Monitoring of Marking, Micro-welding, and Micro-Machining Systems

Monitoring of energy or power as they are delivered after the focusing lens, providing a fast and direct control of the correct values for the process, of the optical system or optical fiber integrity can be done with LPM by simply displacing the optics or the translation stages.