

Product release: ZFSM

Freiburg, 18th February, 2013

Fibre-coupled laser technology

Freiburg, Germany – Z-LASER, a leading manufacturer of laser modules and laser systems, presents fibre-coupled laser systems. Its newly developed “ZFSM” laser systems utilize the inherently superior optical properties of fibres. This new product is especially suitable for applications with highest requirements in projection accuracy that is demanded in industrial machine vision and medical application.

Optical properties of fibres are superior compared to bare laser diodes in terms of the beam profile ($M^2 \sim 1.05$) and the geometry of the dispersion. ZFSM yields small and perfectly round spots for point projection optics and thinner, more homogeneous lines with line generator optics. (e.g. 8µm at 30mm working distance, $1/e^2$ and $\pm 5\%$ line homogeneity).

ZFSM separates the optics by an optical fibre from the laser source with its electronics harness. The heat generated by electronics and laser source has no more direct influence on the optics (high projection stability). The optic can be located up to several meters away from the laser source. For applications with high ambient temperatures, for example the measurement of red-hot steel, the lifetime of the laser diode is significantly increased. By using standard fibre connectors the projection optics can be changed within a running system.

ZFSM is offered as pure OEM solution with bare electronics module, a fixed fibre and attached optics module or comes as a housed laser source with driver electronics and standard fibre connection. The customer can insert easily his own fibre application or use ZFSM fibre and optics accessories. Due to fibre coupling, the module can be scaled arbitrarily. For example, multiple laser sources (RGB) can be controlled individually and then be coupled in one or more fibres.

ZFSM – main features:

- Supports laser diodes with red, blue, green, IR up to ca. 50mW (in the projection)
- Fibre length on request, 500mm by default
- Variety of point and line optics with various specs, DOE projection optics
- Pointing stability: $< 3 \mu\text{rad} / ^\circ\text{C}$
- Spot/Line width: down to 15µm at 100mm working distance
- Line homogeneity: $\pm 5\%$
- Focus range: 20mm to infinite
- Power stability: $< 1\%$ (T_{const} , 1h); $< 5\%$ ($T_{\text{min}}-T_{\text{max}}$, 24h); $< 15\%$ ($T_{\text{min}}-T_{\text{max}}$, entire Lifetime)
- Digital Modulation: up to 100 kHz
- Analog modulation: up to 100 kHz (concurrently to digital modulation)
- Supply voltage: 4.5-30VDC; power-supply from USB is supported on request
- Operating temperature: -10°C to 50°C
- Serial Communication Interface: I²C, RS-232
- Possibility of functional enhancements like Peltier Cooling, USB communication, Ethernet and Memory Expansion for complex customized control schemes
- Possibility of cascable design (e.g. RGB configurations)
- Complies to IEC-60825:2007 (all laser classes) and IEC 60601-2-22 (class 3R and higher), first-fault-secure and functional safe. Ready for medical product market.

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About Z-LASER

Since inception in 1985, **Z-LASER** is known as a manufacturer of industrial laser systems for manufacturing, machine vision, measurement and medical applications as well as appliance in analysis and science. The team has its own large development department that utilizes our expertise in optoelectronics and laser technology to come up with innovative solutions. For more company details see www.z-laser.com.