

The FISBA RGBeam™

Three Co-aligned Diode Laser Sources in One Convenient Package

The FISBA RGBeam is a compact light engine capable of delivering adjustable illumination across free space or through a single mode fiber. The FISBA RGBeam's compact size and efficient coupling make it an excellent light source for use in life sciences, industrial metrology, and illumination applications. FISBA's engineers also have the expertise to customize and adapt the configuration to meet specialized requirements, making this light engine the optimum solution for a wide range of systems.

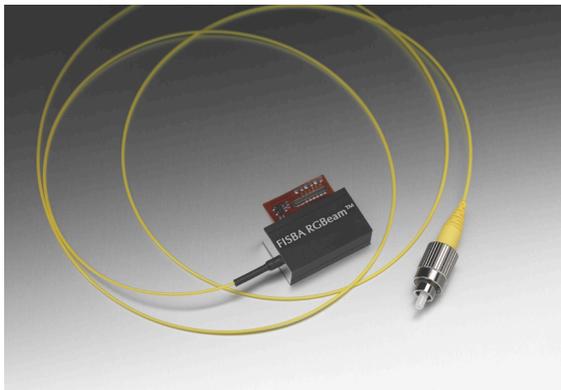
The FISBA RGBeam can be integrated with three or more laser diode sources, e. g., 638 nm red, 520 nm green, and 450 nm blue. The laser diodes are mechanically registered to a common plane, and precision optics



FISBA RGBeam™

circularize, align, and combine the beams. The single mode fiber configuration of the FISBA RGBeam couples the light with high efficiency and stability, resulting in typical output

power of 50 mW of red, 40 mW of green, and 30 mW of blue light. For applications where polarization control is important, the module can easily be outfitted with polarization-maintaining fiber. The fiber-coupled configuration provides a great deal of physical flexibility, as the fiber can be routed at will to the location where the point source is necessary.

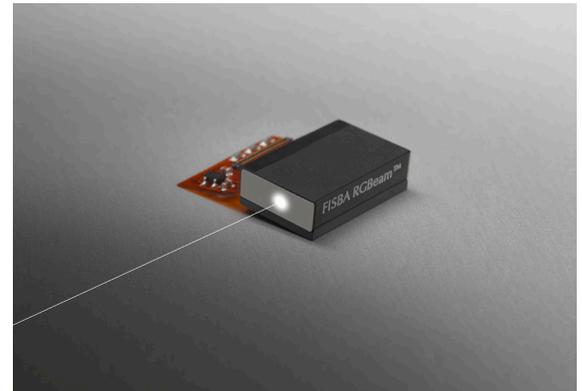


FISBA RGBeam™ – single mode optical fiber

The free-space configuration of the FISBA RGBeam is also flexible. Although it doesn't offer quite the same physical freedom as the fiber-coupled version, the free-space package measures only 20.5 by 13 by 5.9 mm. That small size means it can be easily integrated into the optomechanical assembly of both large and small instruments. The output power of the free-space RGBeam provides up to 80 mW of red, 65 mW of green, and 65 mW of blue light. The three beams are co-aligned to within 0.2 milliradians, in a well-collimated beam that maintains a diameter of 1 mm at a distance of 1 meter.

The FISBA RGBeam also offers nearly complete control over the composition of the light. For illumination applications, for example, the color coordinates of the output light can be tuned to anywhere within the gamut achievable by the RGB laser diodes. And system designers

can also take advantage of the quick response time of the laser diodes to tune the temporal characteristics of the light as well.



FISBA RGBeam™ – free space propagation

An Efficient Source for Varied Applications

The compact size, the high quality optics, and the flexible control suit the light engine for applications in a variety of fields. Some possible applications illustrate ways in which system designers can incorporate the FISBA RGBeam into their instruments.

For example, a medical device company may be developing a surgical endoscope. There may be certain internal anatomies where illumination of different wavelengths highlights distinct structures. By incorporating a fiber-coupled FISBA RGBeam into the endoscope the instrument designer can provide the ability to tune the illumination to the appropriate color for a given phase of a surgical procedure.

The FISBA RGBeam is also useful in research settings. For example, assume a company wants to develop an instrument to evaluate the biochemical mechanisms of photosynthesis. Plants harvest energy from sunlight, but they also can be damaged by excessive solar

energy. Plants have adopted a number of mechanisms to balance these needs. To investigate these mechanisms an instrument would need to be able to deliver prescribed amounts of red, green, and blue light. The spatial and temporal characteristics would need to be well controlled. The FISBA RGBeam features make this design problem simple.

The light engine is just as valuable for industrial applications. The flexible power output of the FISBA RGBeam adds to its utility, and it easily integrates with scanners or MEMS devices to produce powerful systems solutions. Those capabilities, for example, allow designers to easily solve projection requirements in industrial environments.

These representative applications are by no means exhaustive. The FISBA RGBeam gives powerful performance in a compact package, and it's the optimum design choice for a number of applications. It is an exceptional option for manufacturers of therapeutic devices, spectroscopic and other analytical devices, and industrial sensors.

Superior Engineering in Every FISBA RGBeam

Conceptually, the requirements for the source in each of these applications are fairly straightforward. These applications require separate light sources to be collimated and co-aligned such that they can be separately controlled. The value of the FISBA RGBeam lies in the quality of its design and engineering.

The attention to detail is evident throughout the design. The mechanical assembly of the diode packages establishes a baseline alignment. Circularizing optics, located near the diodes, minimize the asymmetry of each beam.

A set of filters and prisms aligns the beams on the same optical axis. Attention to the opto-mechanical design means the three beams are integrated into a single stable assembly, giving designers the powerful functionality of an adjustable three-wavelength source without the headache of needing to align multiple diodes.



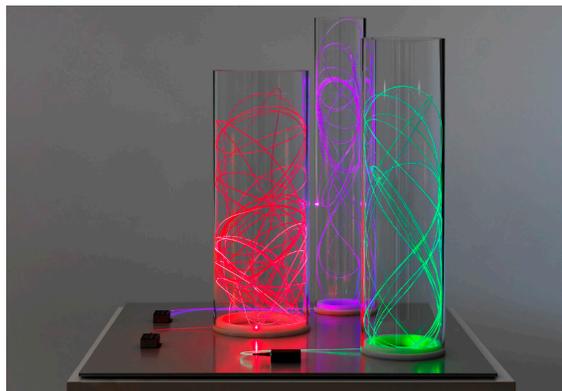
FISBA RGBeam™ – Set up

That's the key advantage of the FISBA RGBeam. For applications that need the flexibility of tunable illumination, the exceptional engineering of the light engine reduces the complexity of the integration problem. Designers need only mechanically attach the compact package, manage the thermal interface, and furnish electrical power and electronic control to the diodes.

The standard diode wavelengths in the FISBA RGBeam are sufficient to meet the needs of applications in a wide variety of fields, but designers with very specialized applications may have need of other wavelengths. The FISBA RGBeam can easily be customized, integrating diode lasers of the customer's choice. In addition, the fiber-coupled light engine can be fabricated with specialty fiber of various types. And designers who would like unique beam profiles from the free-space FISBA RGBeam can work with FISBA engineers to produce a light engine with various beam shaping optics. These solu-

tions provide the stability and convenience of the standard FISBA RGBeam in customized packages that meet atypical requirements.

Parameter	Fiber-Coupled RGBeam	Free-Space RGBeam
Standard Diode Wavelengths	638/520/450 nm	
Typical Optical Power	50/40/30 mW	80/65/65 mW
Beam Alignment	–	0.2 mrad
Spot Diameter (1/e ² @1 meter)	–	< 1 mm
Numerical Aperture	0.12	–
Package Size	27 × 16 × 8.5 mm	20.5 × 13 × 5.9 mm



FISBA RGBeam™ – Exhibition object