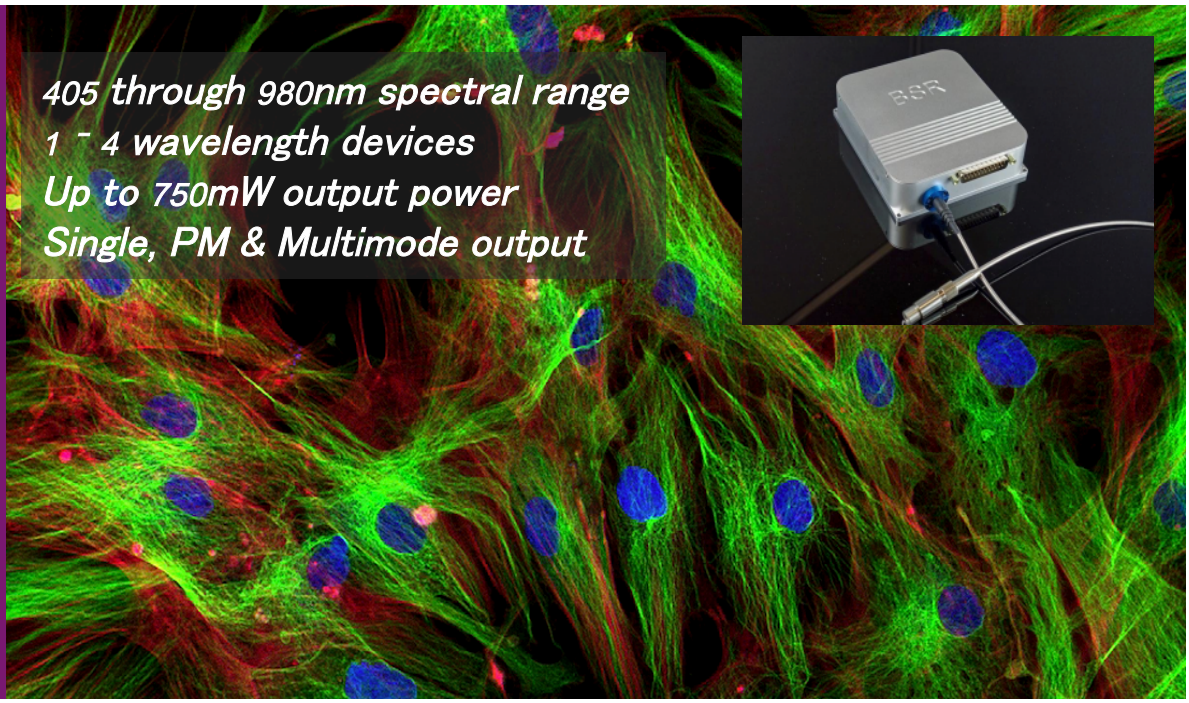
Fiber Coupled Lasers
Systems & Components

BLUE SKY RESEARCH

Fiber Coupled Laser Illumination



Single and Multi-Wavelength Laser Sources

Blue Sky Research is a world leading expert in precision fiber-coupling and micro-optic beam adaptation of laser diodes, including red, green, blue, violet, and IR laser systems, and OEM laser components. Fiber Coupled Laser products deliver between 1 and 4 laser sources on one single mode, PM (Polarization Maintaining single mode) or multimode output fiber. All products can be mass produced in OEM volumes and delivered to meet your production timing and inventory requirements.

Fiber Coupled laser products use a direct laser coupling system which efficiently couples a lasers power into an optical fiber and ensures the system never needs alignment through the products lifetime. Enhanced performance and reliability testing ensures exceptional product performance. System level products integrate temperature controlled lasers with individual driving, control and stability electronics. Devices can be ordered with a variety of collimation optics which allow easy integration into your system. A wide variety of laser sources and wavelength-power options are available.

Product Line Features

- Individually controllable Lasers
- Integrated drive, power, control circuits
- Custom wavelength and power options
- Single mode, PM, Multimode Fiber options
- Rugged OEM grade single unit packages

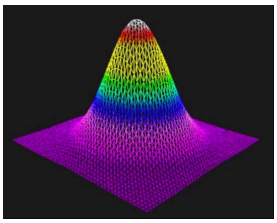
Applications

- Bio-Imaging, Fluorescence Imaging
- Endoscopy Illumination
- Food Safety
- Medical Devices
- Ophthalmology Instrumentation

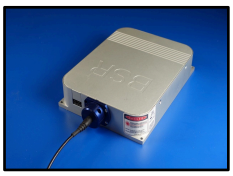
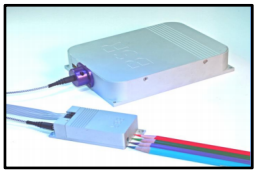
The Advantages of Using Fiber

The unique properties of optical fibers enable system designers to simultaneously optimize an optical systems performance, reduce manufacturing complexity and cost, and provide a more stable and robust system performance. Optical designers exploit a single mode fibers Gaussian beams ability to pass through simple lenses without introducing aberrations. System performance can be optimized while using inexpensive optics for relay and beam shaping. In addition, optical fibers posses the ability to maintain beam pointing and steering tolerances (<1urad/c) throughout temperature variations better than all traditional optics, enabling a robust and stable system performance.

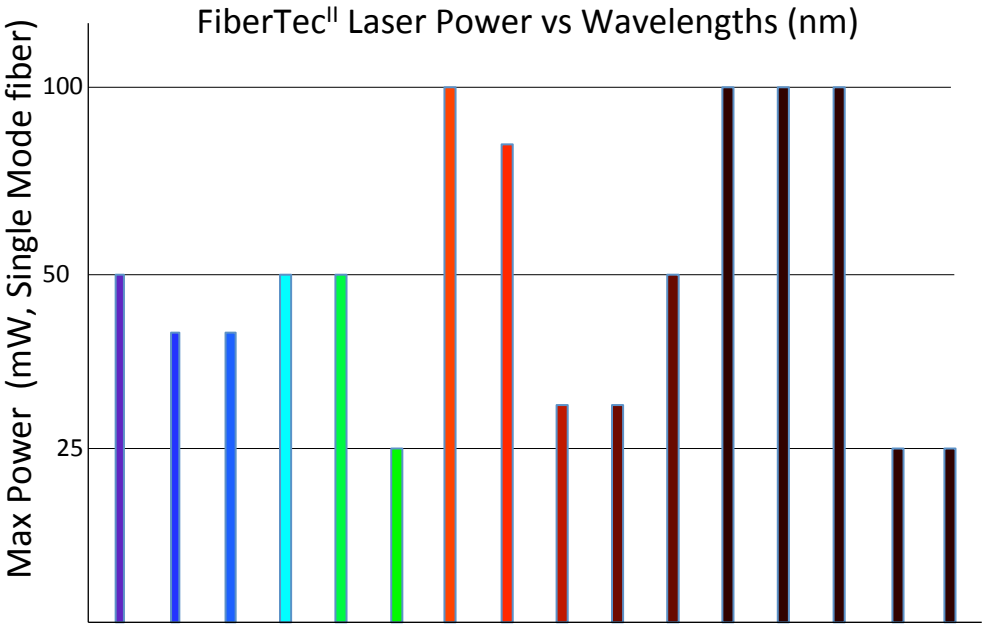
Also, multiple laser beams of different wavelengths can be transported through the fiber and will exit with perfect beam co-linearity and a Gaussian beams intensity profile. Lastly, the fiber can be used to remotely locate the laser module from the optical path or illumination target, giving optical system designers more flexibility in system layout without any compromise to performance.



System and Component Specifications

FiberMax	FiberTec[II]	SpectraTec[II]	SpectraTec RGB	SpectraTec X
Single Laser	Single Laser	2 Lasers	3 Lasers	Up to 4 Lasers
Single Mode	Single Mode	Single/Multimode	Single/Multimode	Single Mode
				
405nm – 980nm	405nm – 980nm	405nm – 980nm	450nm,520nm, 638nm	405nm – 980nm
Component	Integrated Electronics	Integrated Electronics	Integrated Electronics	Integrated Electronics
5V ± 0.5 or 8V + 0.5	5V ± 0.5 or 8V + 0.5	5V ± 0.5, 8V + 0.5	5V ± 0.5, 8V + 0.5	5V ± 0.5, 8V + 0.5
3 Pin Analog	16 PCB pins, or 8 wire ribbon	25-Pin D-sub connector	37-Pin D-sub connector	37-Pin D-sub connector

Laser and Power Options



	405	450	473	488	520	532	638	658	705	740	785	808	830	850	905	980
FiberMax (mW)	50	40	40	50	50	25	100	80	30	30	50	100	100	100	50	100
FiberTec II (mW)	50	40	40	50	50	25	100	80	30	30	50	100	100	100	50	100
SpectraTec II (mW)	25	20	20	25	25	15	50	40	15	15	25	50	50	50	25	50
SpectraTec X (mW)	25	20	20	25	25	15	50	40	15	15	25	50	50	50	25	50
SpectraTec RGB SM* (mW)		20			25		50									
SpectraTec RGB MM* (mW)		500			200		50									

* SM Single Mode, MM Multimode

Collimation and Feedback Systems

The Fiber Feedback Collimator (FFC) is a SpectraTec X or RGB option Power Stability of <0.5% under normal operating conditions is achieved using this technology. The FFC functions with all fiber types; Single Mode, Polarization Maintaining single mode, or Multi-Mode fiber. Beam shaping, collimation or custom relay optics can be installed to match optical system requirements.

Collimation and closed loop feedback options are also available for the FiberTec II single wavelength system. A “bullet” collimator can be fit with custom relay or collimation optics with diameters ranging between 0.8 to 3.3mm. A closed loop feedback system is also available and can operate with any fiber type; providing power stability of <0.5%.

.

Key Parameters

	SpectraTec X SpectraTec RGB SM	SpectraTec RGB Multi-Mode	SpectraTec^{II}	FiberTec^{II}	FiberMax
# Lasers	Up to 4 Lasers	3 Lasers	Up to 2 Lasers	1 Laser	1 Laser
Integrated Electronics	Drive, TEC Control, ESD protection, Stability circuits	Drive, TEC Control, ESD protection, Stability circuits	Drive, TEC Control, ESD protection, Stability circuits	Drive, TEC Control, ESD protection, Stability circuits	NA
Electrical Connectivity	37-pin D-Sub: Analog/digital, LD Control, monitors, status, PWR/GND	37-pin D-Sub: Analog/digital, LD Control, monitors, status, PWR/GND	25-pin D-Sub: Analog/digital, LD Control, monitors, status, PWR/GND	16 Pin Butterfly: Analog/digital, LD Control, monitors, status, PWR/GND	Analog 3 PIN: PD, LD, GND
Operating Modes	APC, or ACC	APC or ACC	APC or ACC	APC, ACC	User supplied
Modulation Std High Speed	10KHz: ACC or APC 1MHz: ACC only	10KHz: ACC or APC 1MHz: ACC only	10KHz: ACC or APC 1MHz: ACC only	10KHz: ACC or APC 100kHz: ACC only	User circuit limited: >1GHz capable
Collimation Feedback	Spectrometer, all λ monitor+/feedback, collimation or relay optics capable	Spectrometer, all λ monitor+/feedback, collimation or relay optics capable	collimation or relay optics capable	PD λ monitor, laser power feedback, collimation or relay optics capable	collimation or relay optics capable
Footprint	165mm x 125mm	165mm x 125mm	125mm x 105mm	71mm x 24mm	23mm x 17mm
Fiber Types	Single Mode PM Single Mode Multi-Mode	Single Mode PM Single Mode Multi-Mode	Single Mode PM Single Mode Multi-Mode	Single Mode PM Single Mode	Single Mode PM Single Mode
Cable Types	3mm Buffer 3mm Armored	3mm Buffer 3mm Armored	3mm Buffer 3mm Armored	3mm Buffer 3mm Armored	900µm Buffer 3mm Buffer 3mm Armored
Customizable	OEM Specific	OEM Specific	OEM Specific	OEM Specific	Unique LD

Blue Sky Research is ISO 9001:2015 Certified

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Blue Sky Research follows a policy of continuous product improvement. Specifications are subject to change without prior notice. Blue Sky Research's lasers comply with Federal Regulations (21 CFR Subchapter J, Part 1040) as administered by the Center for Devices and Radiological Health.

Blue Sky Research offers a limited warranty for all products. For full details of warranty coverage, please refer to Terms and conditions section at www.blueskyresearch.com or contact your sales or service representative. FCLB-01152020 Rev.A