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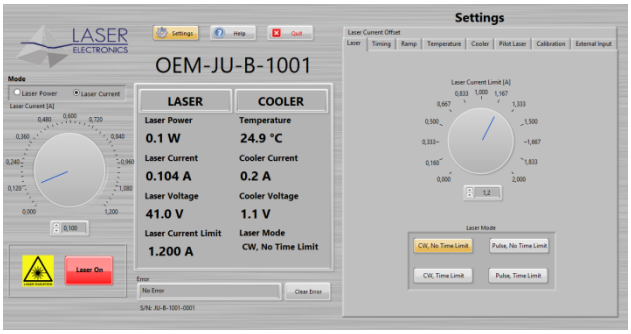
Blue Laser System
BlueStar



LETSoft program

BlueStar Controller BSC1000

Integrated Components

Blue Laser Diode from 0 to 25W
TEC-Cooler COOL-BS (Peltier cooler)
BSC1000:
- Laser Diode driver up to 2 x 60V / 1.2A
- TEC-Driver up to 48V / 13A unipolar

Features

Gilded heat spread plate
CW and pulse operation
Laser ramp function
RS232 PC Interface
User friendly LabVIEW program
Interlock function
Detachable fiber

Applications

Material processing
General purpose laboratory instrument
Laser soldering
Plastics welding
Medical application
Pumping solid state and fiber lasers
Illumination

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Description

The Blue Laser System BlueStar conveniently offers a modular diode laser system. All necessary components such as the laser diode, the laser diode driver, the TEC-driver and the laser diode cooler are included.

Intuitive User-Friendly Interface

An internal microprocessor provides the flexibility and convenience of software. Our LabVIEW based program LETSoft can be used to control the Blue Laser System BlueStar. All parameters can be set and controlled by a PC via RS232 interface.

Built-In Laser Diode Protection Features

The Blue Laser System BlueStar features advanced circuitry to protect both the laser diode and the controller. Safety features include transient suppression, a suitable mains filter, delayed output enable, hardware interlock and a relay closure shorts the laser output when power to the Blue Laser System BlueStar is turned off.
An additional feature is if the laser temperature departs from a user defined temperature window, the laser current is switched off automatically.

Laser Ramp Function

The instrument can create a ramp shaped laser power. The laser power will go to the new value within a set time linearly. It can ramp up and down. Several ramp parts and also constant power parts can be combined to a customized power function.

Laser Diode Current Modulation

External inputs allow analogue modulations. An internal pulse generator allows digital modulation. The maximum modulation frequency of the laser diode current is 100Hz.
As a safety feature, the laser current limit cannot be exceeded during external modulation. The range for the signal is 0 V to +10 V. The transfer function is 1 A / 5 V.

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Power Monitor

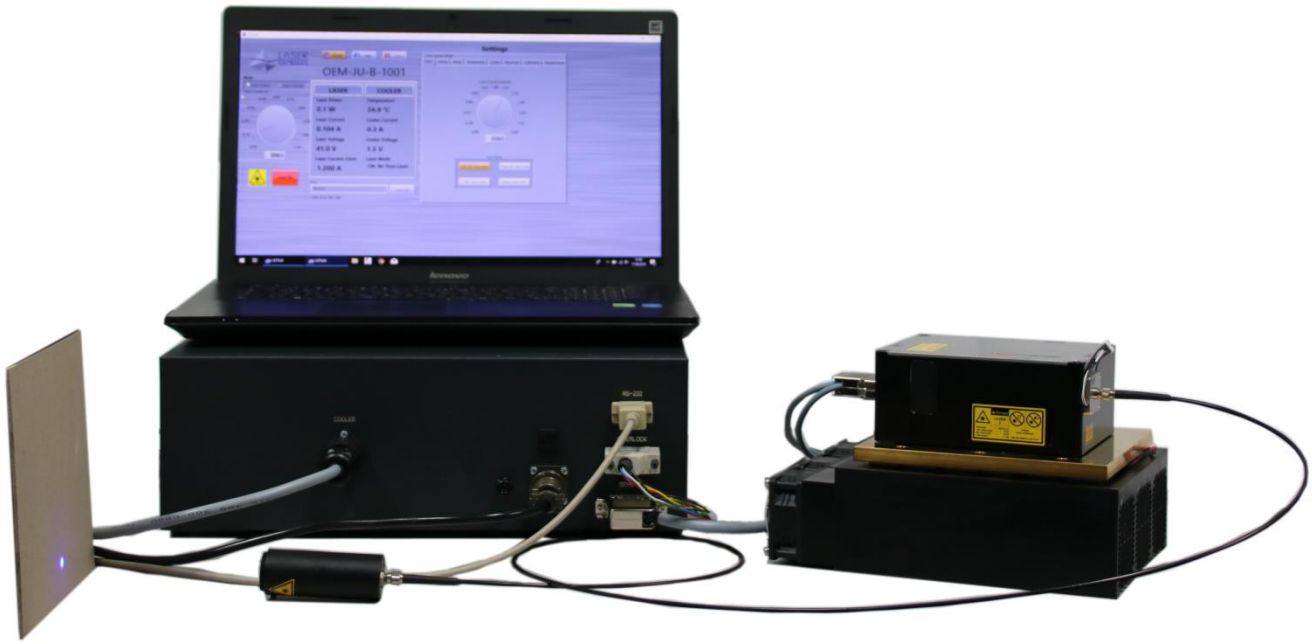
The instrument provides a power monitor output. This signal indicates the actual laser diode current. The range for the signal is 0 V to +10 V. The transfer function is 1 A / 5 V.

Quasi Power Setting / Monitoring

Because the laser driver is current controlled, the laser power cannot be controlled directly. But the user can set two calibration points at the P/I characteristic line and the Blue Laser System BlueStar calculates the set power into set current and measured current into actual power. So the user can choose to set the laser current or set the laser power and can read the actual current and the actual power.

Error Indication

In any case of error, such as exceeding the customer set limits, the diode current is turned off immediately and an error message is send to the PC.



Example of Blue Laser System BlueStar, consisting of Blue Laser Diode, TEC-Cooler COOL-BS, laser and cooler controller BSC1000 and laptop with LETSoft program

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Specifications

Optical parameters of the blue laser diode		
Optical Output Power	[W]	25
Wavelength	[nm]	450
Wavelength tolerance (±)	[nm]	10
Fiber core diameter	[µm]	400
Numerical Aperture	[NA]	0,22
Fiber Connector		SMA
Electrical Parameters		
Typical Operation Current	[A]	1.0
Max. Operation Current	[A]	1.3
Typical Threshold Current	[A]	0.2
Typical operation voltage	[V]	120
Typical slope	[W/A]	32.60
Additional Features optional evaluable		
Fiber detection sensor		*

Laser Diode Controller (integrated in BSC1000)	
Power Laser Diode Driver	2 x 150 W
Max. Laser Diode Current	3.75 A
Max. Laser Diode Voltage	2 x 60 V
Ripple / Noise (rms)	200 mV
Current Limit Range	0 … Max. Laser Diode Current
Current Adjustment Accuracy	1 mA
Temperature Coefficient	< 100 ppm/°C
Short Term Stability (1hr)	< 30 ppm
Long Term Stability (24hr)	< 75 ppm
Repetition Rate	0 … 100 Hz
Pulse Width (*)	> 5 ms
Rise- / Fall-Time (*)	< 3ms (10 % – 90 % of max. current)
Analogue Modulation	
Input Voltage	0 … 10 V, 1 kΩ
Transfer Function	1 A / 5 V
Bandwidth	0 … 100 Hz
Power Monitor	
Output Voltage 0 … 10 V	Output Voltage 0 … 10 V
Transfer Function 10 A / V	Transfer Function 1 A / 5 V

TEC Controller (integrated in BSC1000)	
Temperature Range	0 ... 50 °C
Temperature Stability	< 0,1 K
Temperature Adj. Accuracy	0,1 K
Control Loop	PI
Output Cooler	
TEC Output Power	600 W
TEC Current	0 ... 13 A
TEC Voltage	0 ... 48 V
TEC Current Limit Range	0 ... 13 A
Ripple	100 mA
Fan Voltage	24 V
Fan current	max. 4 A
Temperature Sensors	
Sensor Type	NTC
Thermistor	NTC, 10 k @ 25°C, current: 100 µA
Power Supply	
Line Voltage	85 - 264 V AC, autoranging
Frequency	50 - 60 Hz
Power Consumption	1.500 W
Fuses rating for 115V AC	16A slow acting (5x20mm)
Fuses rating for 230V AC	8A slow acting (5x20mm)
General Characteristics	
Ambient Temperature, operating	0 ... 30 °C
Relative Humidity, operating	30 ... 70 %
Weight	20 kg
Dimensions Laser and Cooler Controller BSC1000	320 x 140 x 400 (W x H x D, mm^3)
Dimensions Laser Diode + Cooler COOL-BS	245 x 165 x 255 (W x H x D, mm^3)

Notes:
(*) The rise time, the fall time and the pulse width may be prolonged by long cables between the power supply and the laser diode.