



Premier & Acculase Datasheet

Modulatable Laser Diode Modules

Premier & Acculase Range

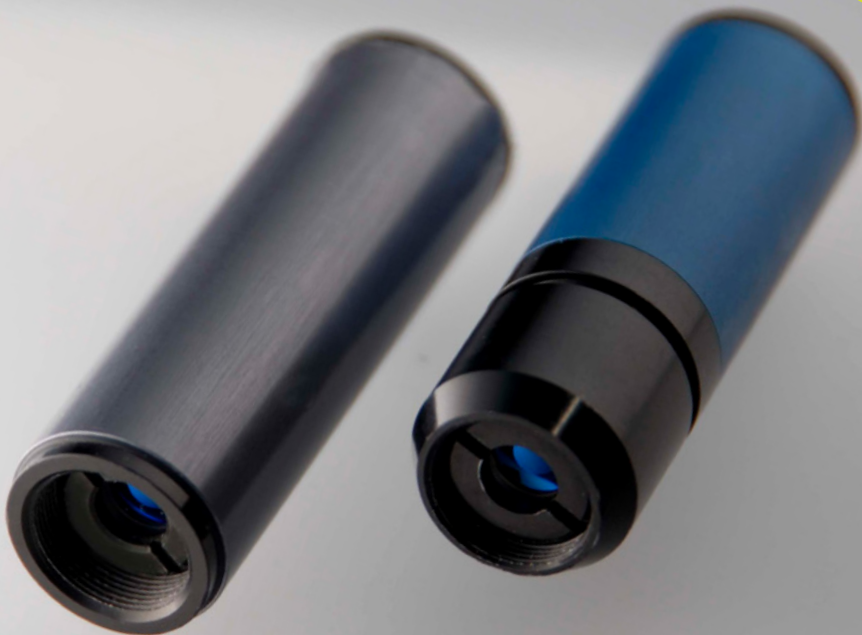
The Premier & Acculase laser diode modules represent the highest level of optical and electrical performance at an economical price, a combination that is unmatched in the marketplace. The Acculase also has the additional benefit of the output beam being accurately aligned to the outer sleeve during manufacture.

The secret of their superiority is a control circuit design that not only gives you excellent output power stability over time and temperature, but also offers fast, closed-loop modulation with an extinction ratio as high as 10,000:1. Two control circuits are available, either the LC (Linear Control) or the PWM (Pulse Width Modulation).

The LC version allows you to control the output intensity linearly by applying a voltage of between 0 to 1 volts, to the control input. The output intensity will faithfully replicate any arbitrary signal you wish to apply within the limits of the laser diode module's maximum rise and fall time.

The PWM version allows you to use pulse width modulation of the output intensity from a TTL level input signal, again within the limits of the laser diode module's maximum rise and fall time. You can therefore control the mean intensity of the laser beam simply by changing the mark to space ratio or modulate the laser with coded information. The PWM 24V model can be powered from an industry standard 24 Vdc supply while retaining the modulation functions of the PWM model.

A wide range of wavelengths, powers and lens options are available, each combination having been carefully selected to provide you optimum performance, while ensuring the laser diode is never over driven.



Key Features



Premier & Acculase

- High boresight accuracy $<1\text{mrad}$ (*Acculase only*)
- Choice of Green, Red and IR wavelengths
- Laser output powers up to 150mW
- Choice of collimating lenses to produce circular or elliptical beams
- Optional range of line optics and diffractive optic patterns
- User adjustable focus
- 5/10Vdc or 5/10-30Vdc supply voltage
- Compact 15mm, cylindrical form factor for easy mounting
- Electrically isolated case
- Reverse polarity protected
- Linear Control (LC) or Pulse Width Modulation (PWM) driver



Linear Control (LC) Models

- Intensity control from 1-100%
- Compatible with sine, square, and triangle waveforms
- Analogue modulation up to 300kHz (*within the limits of the diode's rise and fall time*)

Pulse Width Modulation (PWM) Models

- Switch fully ON/OFF using TTL logic levels
- Control mean intensity by varying duty cycle
- Modulate with coded information
- Synchronise with external measurement devices e.g. photodetector

Specifications

		Acculase LC	Acculase PWM 5V	Acculase PWM 24V	Premier LC	Premier PWM
Mechanical Information						
Mass (grams)		14			17	
Dimensions (mm)		15 x 47			15 x 47	
Housing		Anodised Aluminium				
Isolated Body		Yes				
Lead Length (mm)		500 (Other lead lengths available on request)				
Connector Type		JST PHR4 4pin				
Optical Information						
Diode Power (mW)		1 to 150 *				
Typical Power Stability over Temperature range (%)		≤1% #				
Wavelength (nm)		520 to 980				
Beam Size at Aperture		*				
Beam Divergence		*				
Bore Sighting (mrad)		< 1 (Note 1)			≤10 (Note 1)	
Pointing Stability vs. Temperature		< 0.01 mrad/°C				
Environmental Information						
Operating Case Temperature (°C)		-10 to +45 *				
Storage Temperature (°C)		-10 to +80				
Operating Humidity (%RH)		90 (non condensing)				
MTTF @ 25°C (hrs)		>30,000*				
Electrical Specifications						
Input Voltage (Vdc) (Red Lead - Pin 1)	Red & IR Models	5 Vdc ±5% (Note 2)		5-30	5 Vdc ±5% (Note 2)	
	Green Models	10 ±5%		10-30	10 ±5%	
Input Voltage (Vdc) (Black Lead - Pin 2)		0 Vdc				
Operating Current Drive Circuit (mA)		4 (Typical)		<15	4 (Typical)	
Operating Current (mA)		Varies with laser diode type and temperature				
Reverse Polarity Protection		Yes				
Rise & Fall Times * (µs)		1	<0.5	<1	1	<0.5
Frequency Range		DC to 300KHz (Note 3)	DC to 1MHz	DC to 500Khz	DC to 300KHz (Note 3)	DC to 1MHz
Linear Control Voltage Range (Yellow Lead - Pin 3) LC Version		0-1V (See Chart)	N/A	N/A	0-1V (See Chart)	N/A
Modulation Voltage Range (Yellow Lead - Pin 3)		0-1V	TTL Low = Off TTL High = On	TTL Low = Off TTL High = On	0-1V	TTL Low = Off TTL High = On
TTL Enable (Blue Lead - Pin 4)		N/A	<0.4 = Off >2V = On	<0.4 = Off >2V = On	N/A	<0.4 = Off >2V = On
Earth (Yellow/Green Lead - Pin 4)		Earth	N/A	N/A	Earth	N/A

NOTES

Varies with laser diode type and output power. Data based on Premier 650nm 1mW C2 Lens

* Varies with laser diode type

Note 1 - @ factory set focus

Note 2 - Some LC models may run on 3.3 to 5 volts. Please contact us for availability

Note 3 - Measure with 90% modulation depth sine wave to -3dB

All specifications are typical @ 25°C

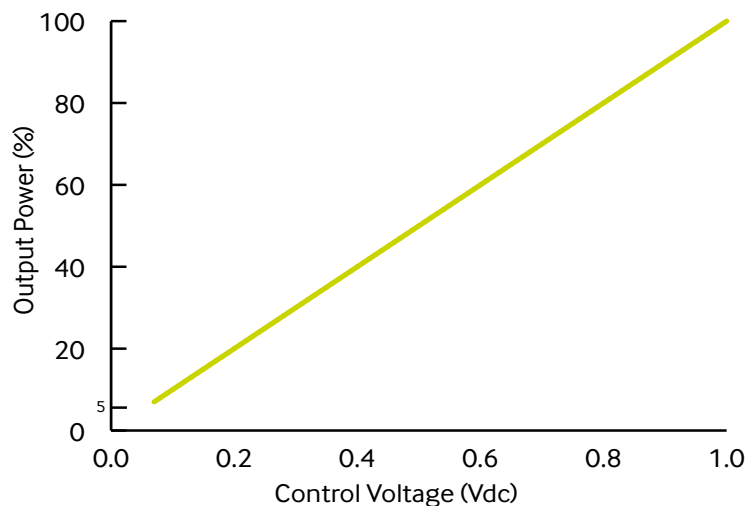
Standard Driver Types

Two driver boards are available for the Premier & Acculase laser, either a Linear Control or Pulse Width Modulation.

Linear Intensity & Analogue Modulation Control (LC Model)

User Adjustable Intensity Control

Using the yellow control lead (pin 3) output power intensity may be linearly controlled from zero to the maximum factory set value. This may be achieved using a simple resistor or by applying a control voltage between 0 and 1V where 0 Vdc is off and +1 Vdc is maximum, with a linear relationship for every value between, e.g. an input of 0.5V would produce an output intensity of half maximum.



Modulation

Using the yellow control lead (pin 3) the laser may be modulated by using an external signal. The required voltage range is 0 to +1 Vdc (to set the maximum intensity), frequency range is DC to 300 kHz. Please note: applying more than 1V does not increase the power above maximum, but it can reduce the maximum frequency of modulation.

Note: Intensity control and modulation functions may be used together.

4th Pin - Earth

The LC versions has a 4th pin which provides a highly resistive path from 0V in order to safely displace any unwanted over voltages.

Pulse Width Modulation TTL Digital Control (PWM Model)

The Acculase/Premier laser is also available with a TTL driver board that allows the unit to be gated on and off, or pulse-width modulated at TTL voltage levels via the yellow control lead.

Rise Time: $< 0.5\mu\text{s}^*$

Fall Time: $, 0.5\mu\text{s}^*$

** = Varies with model*

4th Pin - Enable Function

The PWM/TTL versions have a 4th pin enable function which is also responsive to TTL voltage levels and functions as an electronic switch to quickly turn the laser on and off without the need to disturb the power supply. A TTL level high turns the laser on and a TTL level low turns the laser off.

Lens Options

Three standard user adjustable collimating lens type are available. These are as follows. Please note we have a number of other collimating lens options. If the listed lenses do not meet your requirements please call us.

	C2 Lens	S Lens	HG Lens
Description	2mm Aperture Lens - Produces a circular collimated beam or focused spot	Standard Collimating Lens - Produces an elliptical collimated beam or focused spot	High Quality Aspheric Lens - Produces an elliptical collimated beam or well defined spot over working distance
Beam Size at Aperture (mm)	2	5 by 1.5	5.5 by 2.5
Beam Size at Nearest Focus (μm)	< 50	< 40	< 45
Typical Beam Divergence (Full Angle) (mrad)	0.35	< 0.5	< 0.2
Minimum Focus Distance (mm)	25	25	50



Optional Line Lens Assemblies:-

- L4 Line Lens: Produces a gaussian line with a full fan angle of typically 8°.
 - L8 Line Lens: Produces a gaussian line with a full fan angle of typically 16°.
 - LW53: Produces a gaussian line with full fan angle of typically 90° (*Premier only*).
 - Aligned Rod Lens: Produces gaussian line with a full angle of typically 90° (*Acculase only*).
- Please note other fan angles are available on request.

Power Options

Below is a table of our standard wavelengths and powers for the Premier & Acculase. Please contact us if your requirements are not covered by any of these.

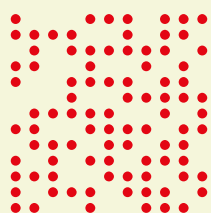
		Maximum Power Output With Lens	
Wavelength	Power	S & HG Lens	C2 Lens
520nm	1, 5, 15, 35, 60mW	60mW	20mW
635nm	1, 3, 5, 10, 15, 20, 35mW	35mW	15mW
650/660nm	1, 3, 5, 10, 20, 30, 50, 80, 100mW	100mW	30mW
670nm	1, 3, 5mW	5mW	1mW
685nm	10, 20, 35mW	35mW	10mW
785nm	1, 5, 10, 20, 35, 50, 75mW	75mW	20mW
808nm	55, 100, 150mW	150mW	55mW
830nm	1, 3, 5, 20mW	20mW	5mW
850nm	1, 3, 5, 20mW	20mW	5mW
880nm	1, 6mW	6mW	1mW
905nm	1, 6mW	6mW	1mW
980nm	5, 30mW	30mW	5mW
Custom	Please call with your requirements		
NOTES Wavelength tolerance can vary typically by ±10nm. Power levels refer to the maximum diode output power. Output power will vary depending on optical configuration. Not all wavelengths and powers are available with all lens options or driver PCB options.			

Options & Accessories

The Premier & Acculase laser modules have a wide range of options to suit a variety of applications. These options include projection optics, mounting clamps, an interface box and laser safety glasses.

Projection Options

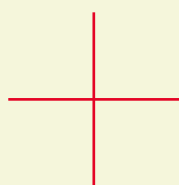
A range of diffractive optical elements (DOE) are available to provide various patterns such as crosses, circles and random patterns for applications such as 3D mapping, surface texture analysis, alignment and general machine vision applications. Please see the Projection Lens Datasheet for further information.



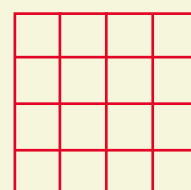
Random Pattern



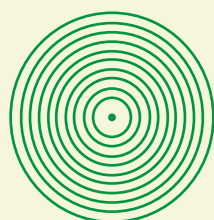
Homogenous,
Gaussian & Dot Lines



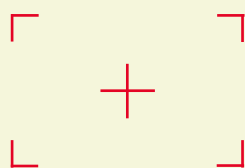
Crosses



Grids



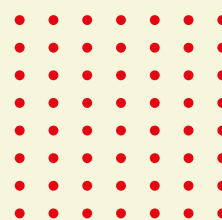
Solid Circles, Dot
Circles & Multiple Rings



Viewfinders



Multiple Lines



Dot Array

Laser Safety Glasses

To compliment the Premier & Acculase range there are a number of laser safety glasses. These provide a protection or block out for a wide range of wavelengths. Below is an example of some of the available glasses styles. For more information on any of the options please refer to the Laser Safety Glasses Datasheet.



Overglasses Style



Wraparound Style

Mounting Clamps

The heavy duty mounting clamp allows the Premier & Acculase to be securely fixed at any required direction or angle. The base plate has a series of threaded holes which allows the clamp to be fixed directly onto a machine or workbench. An optional magnetic base is also available.

The pillow block bearing mount contains a spherical rolling element that serves as a rotational bearing. Enables quick adjustment of the direction in one quick and easy movement without the need for an Allen key. The bearing also provides enough friction to keep the pointing direction stable.

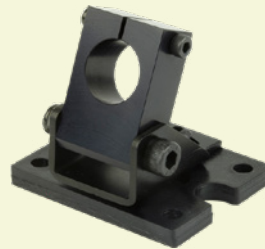
The swivel clamp provides 180° tilt movement and $\pm 45^\circ$ swivel. Its base has a series of holes that allow the swivel clamp to be fixed directly onto a machine or workbench. For more information on any of these options please refer to the Accessories Datasheet.



Heavy Duty Mounting Clamp



Magnetic Mounting Base



Adjustable Swivel Clamp



Pillow Block Bearing Mount

Laser Interface Box

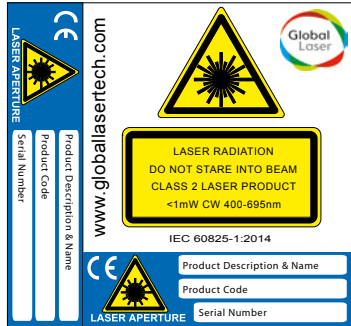
The Laser Interface Box is used to power and modulate most of Global Laser's range of laser diode modules without the inconvenience and cost of building test circuits or wiring looms. An on-board BNC input socket allows you to connect the Laser Interface Box to your existing function generator. In this way, you'll have the ability to modulate compatible laser diode modules with minimal effort. A toggle switch lets you quickly transition between modulation and CW operation. Increasing the safety of your application, an interlock jack is located on the exterior of the Laser Interface Box and a jack plug is provided. An LED indicating the ON/OFF status of laser emission is also present for an additional layer of safety. A 110/240V power supply with UK, US, Euro & AUS plugs is included. For more information on any of these options please refer to the Laser Interface Box Datasheet.



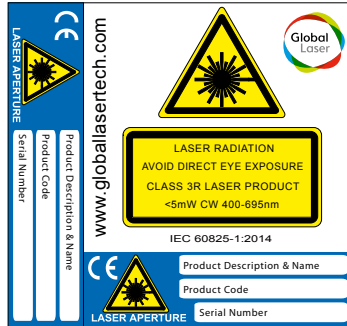
Laser Interface Box

Laser Safety

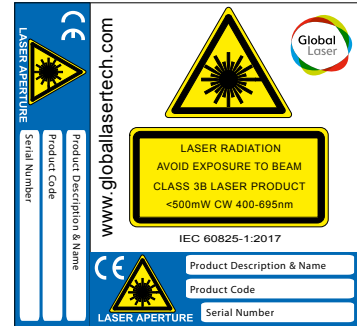
Our lasers are compliant to IEC 60825-1:2014 standards. The lasers fall within one of the following classifications depending on power and wavelength. Examples of the labels are shown below.



Class 2 Label



Class 3R Label



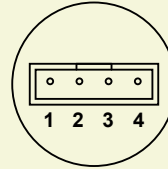
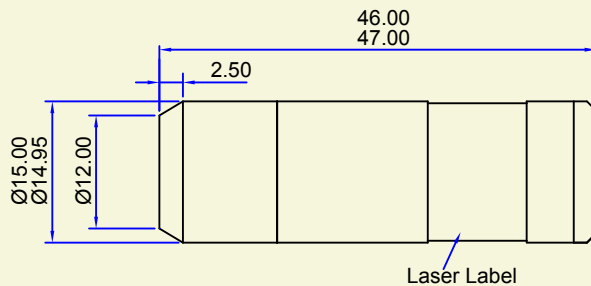
Class 3B Label

Quality & Warranty

The Premier & Acculase range is supplied with a 12 month parts and labour warranty. Our manufacturing operations are certified to ISO9001:2015.

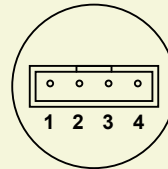
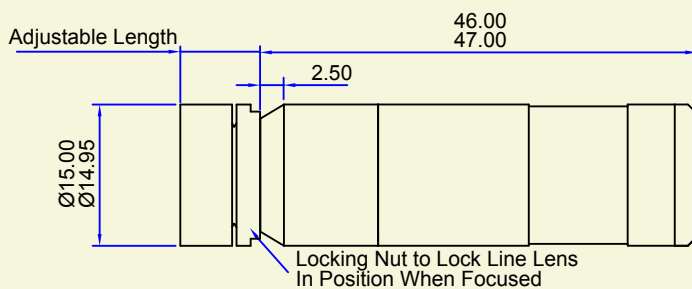
Mechanical Dimensions

Premier LC & PWM



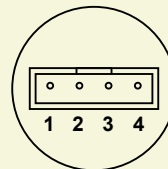
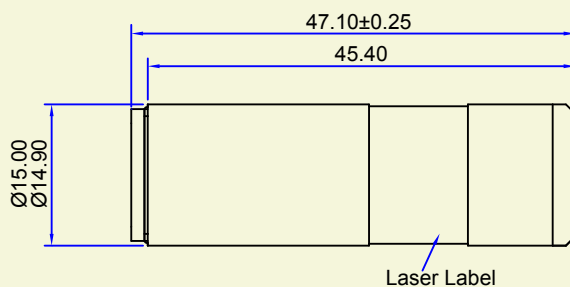
Pin 1 - Red
Pin 2 - Black
Pin 3 - Yellow
Pin 4 - LC = Green/Yellow
Pin 4 - PWM = Blue

Premier LC & PWM with L4/L8/LW53 Line Lens



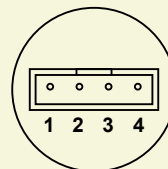
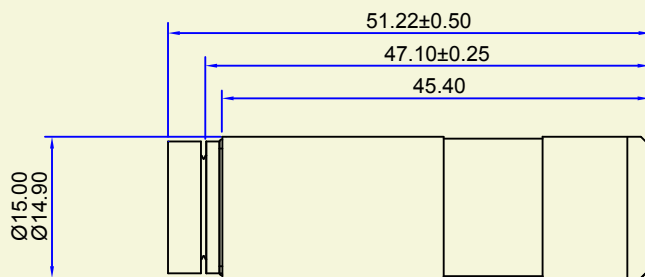
Pin 1 - Red
Pin 2 - Black
Pin 3 - Yellow
Pin 4 - LC = Green/Yellow
Pin 4 - PWM = Blue

Acculase LC & PWM



Pin 1 - Red
Pin 2 - Black
Pin 3 - Yellow
Pin 4 - LC = Green/Yellow
Pin 4 - PWM = Blue

Acculase LC & PWM with L4/L8 Line Lens



Pin 1 - Red
Pin 2 - Black
Pin 3 - Yellow
Pin 4 - LC = Green/Yellow
Pin 4 - PWM = Blue

Please note: Global Laser reserve the right to change descriptions and specifications without notice.

Drawings not to scale

