LDM145 Datasheet

LDM145

The LDM45 is a CW laser diode module capable of emitting lines of different lengths and a variety of shapes and patterns using interchangeable projection optics. It emits an optional circular or elliptical beam that can be converted into lines, crosses, circles, grids, viewfinders, dot arrays, and more.

An innovative approach to structured illumination, you can easily interchange line-generating optics (LGO) and diffractive optical elements (DOE) by hand. The resulting projections can be used to align, position, and target objects of different shapes and surface profiles.

Wavelengths of green (520nm), red (635, 650, 670nm), and infrared (780, 850nm) are available with output powers up to 5mW. The green model emits light that appears more than 2X brighter to the human eye than the equivalent power in 635nm. As a result, you're more likely to see these projections against dark materials, in high ambient light levels, or from long distances.

Housed in an electrically-isolated and ruggedised metallic body measuring 16mm in diameter, the LDM145 is recommended for industrial environments and integration with OEM equipment.

Specifications

Mechanical Information							
Mass (grams)		22.8					
Dimensions (mm)		Ø16.00 x 49.00					
Housing Material		Black Anodised Aluminium					
Power Stability Over Temperature		±2%#					
Focus		User Adjustable					
Isolated Body		Yes					
Input leads		3 Leads / Red (+Ve) /Black (0V) / Yellow (Modulation)					
Lead Length (mm)		215					
Optical Information							
Diode Power (mW)		0.36, 1, 3 & 5					
Wavelength (nm)		520 to 850					
Environmental Information							
		520nm	**635nm**	**650nm**	**670nm**	**780nm**	**850nm**
Operating Case Temperature (°C)		-10 to +55*	-10 to +45*	-10 to +45*	-10 to +55*	-10 to +55*	-10 to +55*
Storage Temperature (°C)		-20 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
Operating Humidity (%RH)		90	90	90	90	90	90
MTTF @ 25°C (hrs)		≥40,000	≥30,000	≥50,000	≥120,000	≥90,000	≥88,000
Electrical Specifications			**LDM145 CW**		**LDM145 TTL**		**LDM145 Analogue**
Input Voltage (Vdc) (Red Lead)	Red & IR Models		+3.5 to +5.0		+5.0 ±5%		
	Green Models		+10 ±5%				
Input Voltage GND (Vdc) (Black Lead)			0				
Reverse Polarity Protection			Yes				
Typical Operating Current (mA)			20 to 140				
Connector Type			Flying Leads				
Rise & Fall Times (µs)	Red & IR Models		N/A		≤1		≤0.5 #
	Green Models		N/A		≤2		≤1
Frequency Range	Red & IR Models		N/A		DC to 300 kHz		DC to 1MHz # (Note 1)
	Green Models		N/A		DC to 10 kHz		DC to 300 kHz
TTL Modulation			N/A		Off <50mV On >2.0V		N/A
Linear Control Voltage Range (Yellow Lead)			N/A		N/A		0-1V (See Chart)
Modulation Voltage Range (Yellow Lead)			N/A		N/A		0-1V

NOTES

* The operating temperature range is dependant on the laser diode fitted. The quoted information is the minimum range. Some powers may have a wider operating temperature range. Please contact us for temperature range for individual models.

Varies with laser diode type and output power. This data is based on the LDM145G/635/1.

Note 1 - Measure with 90% modulation depth sine wave to -3dB

All specifications are typical @ 25°C

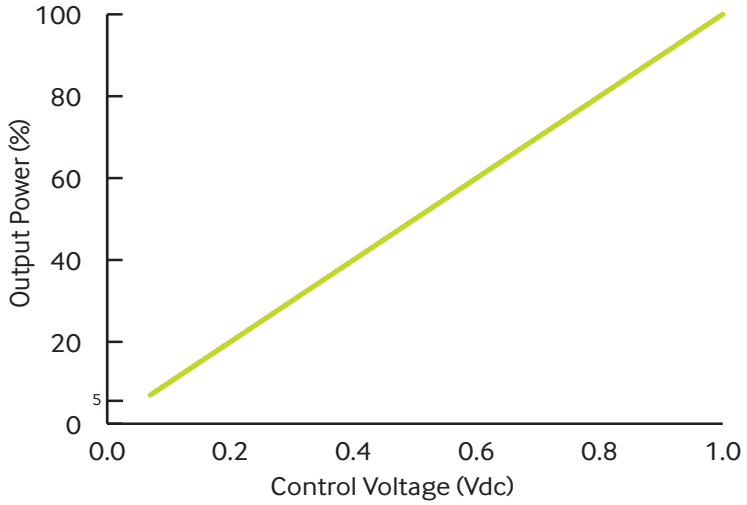
Modulation

The LDM145 is a CW laser diode module. There are two optional modulation features available.

Linear Intensity & Analogue Modulation Control (LC Model)

User Adjustable Intensity Control

Using the yellow control lead 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 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 300kHz (Red and IR Models) and ≤10Khz (Green Models). 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.

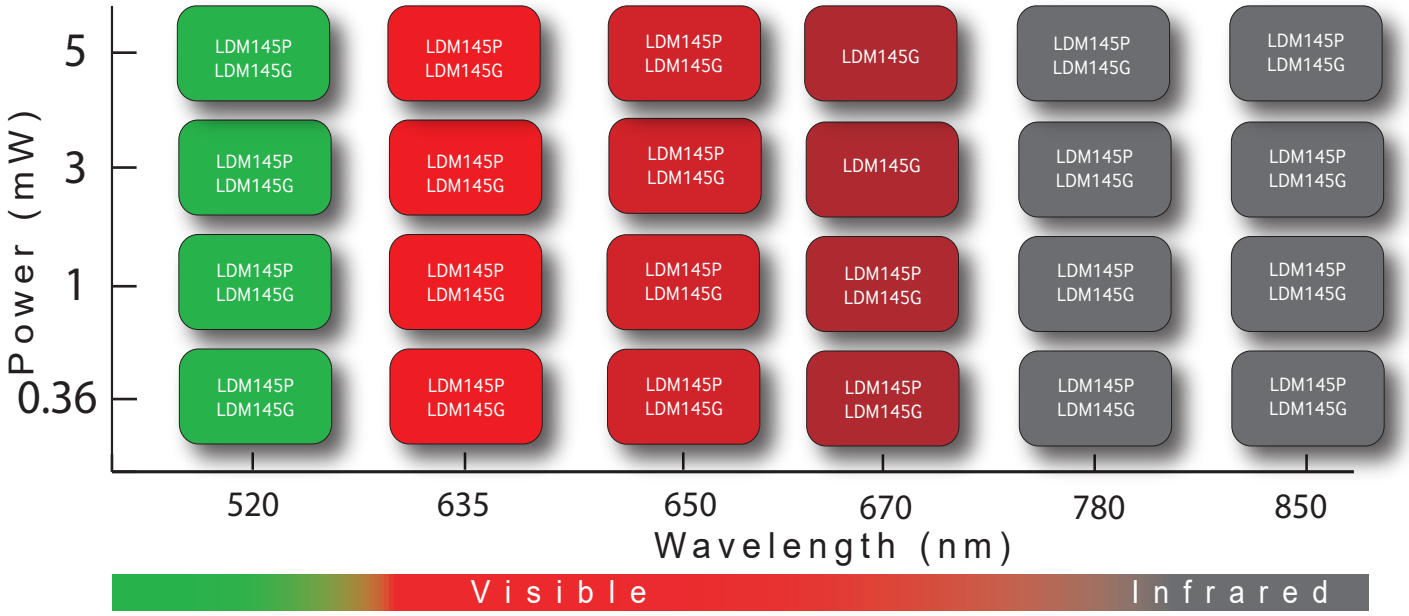
Pulse Width Modulation TTL Digital Control (PWM Model)

The LDM145 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: < 0.5µs*
Fall Time: , 0.5µs*
* = Varies with model

Product Matrix

Customised Versions:- If the power or wavelength you require is not listed then please contact Global Laser directly or your local distributor.



Optical Information

Lens Information

The LDM145 laser modules are available in the following lens types.

G Lens Type	Glass Lens The glass lens is a high quality lens producing fine spots. The lens provides high stability over extremes of temperature and is immune to damages such as scratches.
P Lens Type	Plastic Lens The long focus plastic lens with a low numerical aperture yields good quality circular collimated beams over larger distances.

	G Lens	P Lens
Focus Range	35mm to infinity	150mm to infinity
Beam Size @ Aperture (mm)	4 x 2*	5 x 5*
Beam Divergence (mrad)	<0.5	<0.5
Bore Sighting (mrad)	<25	<25
Minumum Spot Size (µm)	<25	<50
NOTES *Varies with models. Please call us for individual data.		

Optional Line & Cross Generating Optics

LGO's and CGO's are designed to simply slip over the end of the LDM145 and are secured in place by tighening a small locking screw. The focus position of the line or cross can be adjusted by rotating the lens on the LDM145 module prior to the installation of the either optic to give a highly defined thin line of laser light.

	LGO	CGO
Fan Angle (°)	15, 28, 40, 60 & 120	5, 14, 60, 85 & 100
Operational Wavelength (nm)	520 to 850	
Typical Line Width @ 1 Metre (mm)	0.75	<0.8
Length (mm)	26	
Diameter (mm)	22	
Mass	16.5	
Length with LDM115 (grams)	60	
Diameter with LDM115 (mm)	22	
Mass with LDM115 (grams)	39	

Options & Accessories

The LDM145 range has a wide range of options to suit a variety of applications. These options include mounting clamps, laser safety glasses, enhancement glasses and projection lenses

Mounting Clamps

The heavy duty mounting clamp allows the LDM145 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 fiction to keep the pointing direction stable. For more information on any of these options please refer to the Accessories Datasheet.

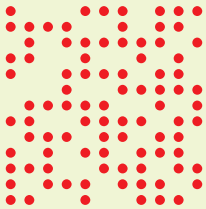
Heavy Duty Mounting Clamp

Magnetic Mounting Base

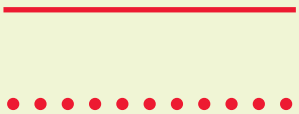
Pillow Block Bearing Mount

Projection Lenses

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.

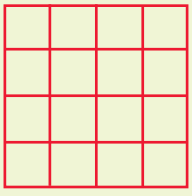


Random Pattern



Homogenous, Gaussian & Dot Lines

Crosses

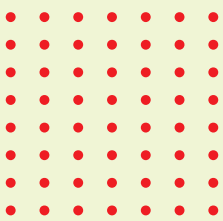


Grids

Solid Circles, Dot Circles & Multiple Rings

Viewfinders

Multiple Lines



Dot Array

Laser Safety Glasses

To compliment the LDM145 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 styles. For more information on any of the options please refer to the Laser Safety Glasses Datasheet.

Overglasses Style

Wraparound Style

Laser Enhancement Glasses

To compliment our wide range of alignment laser diode modules we have introduced a range of Laser Enhancement Glasses. One set which enhance projections in the red wavelength range (630-670nm) and another in the green wavlength range (510-580nm). These work by blocking light in other wavelengths, thus improving the visibility in outdoors or bright lighting condition's. The glasses also meet ANSI Z87 impact standard.

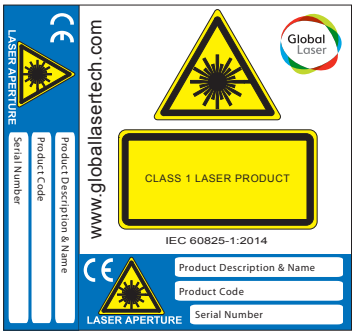
Red Laser
Enhancement Glasses

Green Laser
Enhancement Glasses

Please Note: these are not laser safety glasses, but are conventional safety glasses that enhance the visibility of green wavelengths and do not protect the wearer's eye from the laser. It is recommend that these glass are only used with lasers were the output power conforms to class 2 and 2M.

Laser Safety

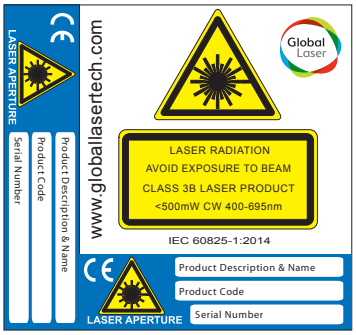
Our lasers are compliant to IEC 60825-1:2014 standards. The lasers fall within one of the following classifications depending on power and wavelength. Examples of the labels are shown below.



Class 1 Label

Class 2 Laser Label

Class 3R Laser Label



Class 3B Laser Label

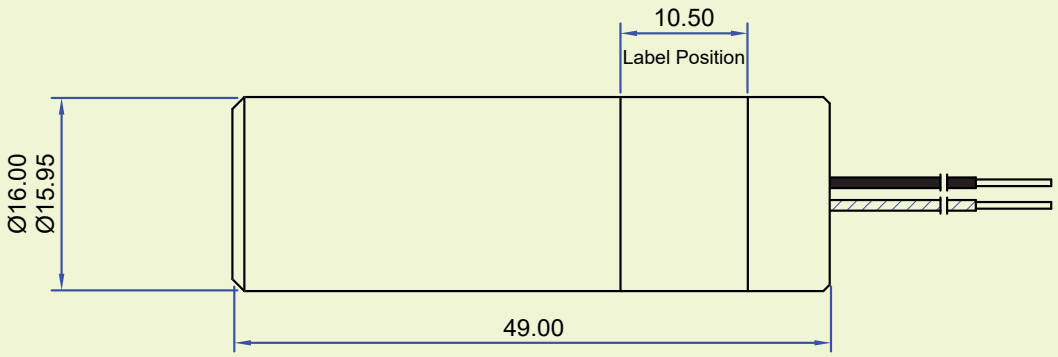
Class 3B IR Laser Label

Quality & Warranty

The LDM145 is supplied with a 12 month parts and labour warranty. Our manufacturing operations are certified to ISO9001.

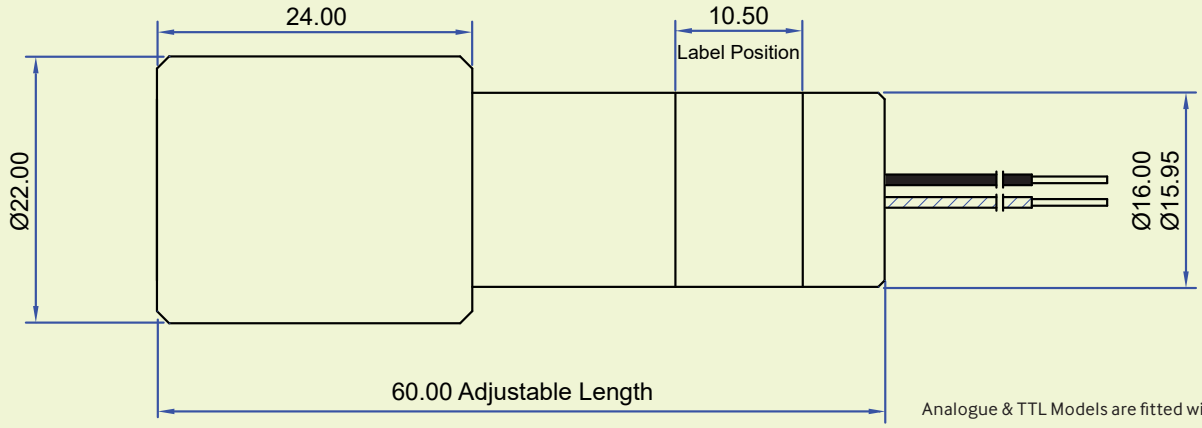
Mechanical Drawings

LDM145 Outline



Analogue & TTL Models are fitted with a third wire

LDM145 Fitted With LGO/CGO Outline



Analogue & TTL Models are fitted with a third wire

Drawings not to scale

For further information about any of our products please contact your local distributor or you can contact Global Laser in the UK. Your Local Distributor Is:

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

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