



**iM**ATRONIC

*A Global Laser Brand*

*LDM150, Sigma, LDM115, LDL175, LCG115 & LLM115*

# imatronic

Imatronic is a family of industry-standard laser diode modules from Global Laser. The ruggedised metallic housing of Imatronic lasers contains the optical and electrical components that you need to safely and accurately project a dot, line, cross, or more complex pattern in a range of applications.

A line or cross optic is available with certain Imatronic models (XXX115) to help in alignment, positioning, or targeting applications. Additionally, a wide range of diffractive optical elements (DOE) can be installed (LDM115 only) to assist in 3D mapping, surface texture analysis, and general machine vision.

Highly reliable in nature, you'll benefit from a long product lifetime and reduced likelihood of diode failure (that is, below the diode MTTF) due to an electrically isolated module housing and reverse polarity protected driver board.

Imatronic lasers can be fitted with a TTL modulation input allowing you to drive your laser using a digital voltage signal. You can then change the mark-to-space ratio to control the mean intensity of the output beam, modulate the laser with coded information, or synchronise the laser with an external measurement device such as a photodetector or camera.

Wavelengths of green (520nm), red (635, 650, 670nm), and near-infra-red (780, 850nm) are available with output powers up to 5 mW. The green Imatronic models emit 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.

Made-to-order or off-the-shelf, Imatronic lasers are typically available with a short lead time. Please contact your local representative or Global Laser directly for a custom solution not in the product matrix included in this datasheet.



# Selection Guide

This catalogue covers the complete Imatronic range and is broken down into various sections. Please use the guide below to go straight to the relevant section.

Page	Section	Description
3-4	Product Overview	General information on all 6 models of the Imatronic laser diode module range.
5	Product Matrix	Overview of the products, powers and wavelengths.
6-7	Specification	Full and detailed specification for all Imatronic lasers.
8	Optical Information	An in-depth overview of lensing options available.
9	Lifetime Data	Lifetime data for each laser model in the Imatronic Range
9	Laser Safety	Information on laser safety and examples of the safety labels.
10-11	Options & Accessories	A list of optional accessories for the Imatronic range of lasers.
13-15	Dimensional Information	Detailed dimensional drawings of each Imatronic product.

# Product Overview

## LDM150 (Dot Projection)



Diameter : 7mm

Length : 25mm

The LDM150 is an extremely compact laser module with a housing diameter of only 7mm. Available in wavelengths of 520nm, 635nm and 650nm with power up to 5mW as standard, it also features the benefits of an isolated housing. A user adjustable plastic aspheric lens produces an elliptical output beam. An optional TTL enable input is also available. The LDM150 has the smallest housing diameter in the Imatronic range and is suited for applications where space is critical and a cost effective solution is required.

## SIGMA (Dot Projection)



Diameter : 10.4mm

Length : 16.5mm

The Sigma laser is a compact 10.4mm diameter, brass body laser diode module available in wavelengths of 520nm, 635nm and 650nm with power up to 5mW as standard. A plastic aspheric lens with user adjustable focus produces an elliptical output beam. An optional TTL enable input is also available. The Sigma has the smallest housing length in the Imatronic range making it suitable for applications with tight space constraints.

## LDM115 (Dot Projection)



Diameter : 11mm

Length : 37mm

The LDM115 is an 11mm diameter laser module available in wavelengths of 520, 635, 650, 670, 780 & 850nm with power up to 5mW as standard. It also features the electrically isolated housing and user adjustable focus. As a further enhancement the LDM115 can be installed with a TTL input. A choice of two collimating lenses are offered. The "G" model uses a glass lens with an elliptical output beam. The "P" model uses a plastic lens which produces a circular output beam. Optional line generating optics (LGO) and diffractive optical elements (DOE) are also available. See page 8 and 10 for more information.

### LDL175 (Dot Projection)



Diameter : 25mm

Length : 58mm or 67mm

The LDL175 laser module is a stand-alone compact laser system, available in 520, 635, 650, 670, 780 & 850nm with powers up to 5mW. It has an industry standard DC power jack input for  $10 \pm 5\%$  Vdc (green) or 3.5 to 5 Vdc (red & IR) and can be supplied with a universal power supply which runs on 100-240Vac input. A glass lens with a user-adjustable focus and elliptical output is fitted as standard. Alternatively, a plastic lens producing a circular output beam can be fitted. It features an on/off switch, LED indicator and safety shutter. The NIR & IR versions also feature an interlock and delay switch. The LDL175 is designed for industrial, laboratory and educational use.

### LCG115 (Cross Projection)



Diameter : 11mm

Length : 37mm

The LCG is an 11mm diameter laser module with an internal cross generator which produces a Gaussian cross with a typical fan angle of  $30^\circ$ . The angle between the lines may also be adjusted to any value between  $0^\circ$  and  $90^\circ$ . It is available in wavelengths of 520nm and 635nm with powers up to 5mW. It also features electrically isolated housing and user adjustable focus. An optional TTL enable input is also available.

### LLM115 (Line Projection)



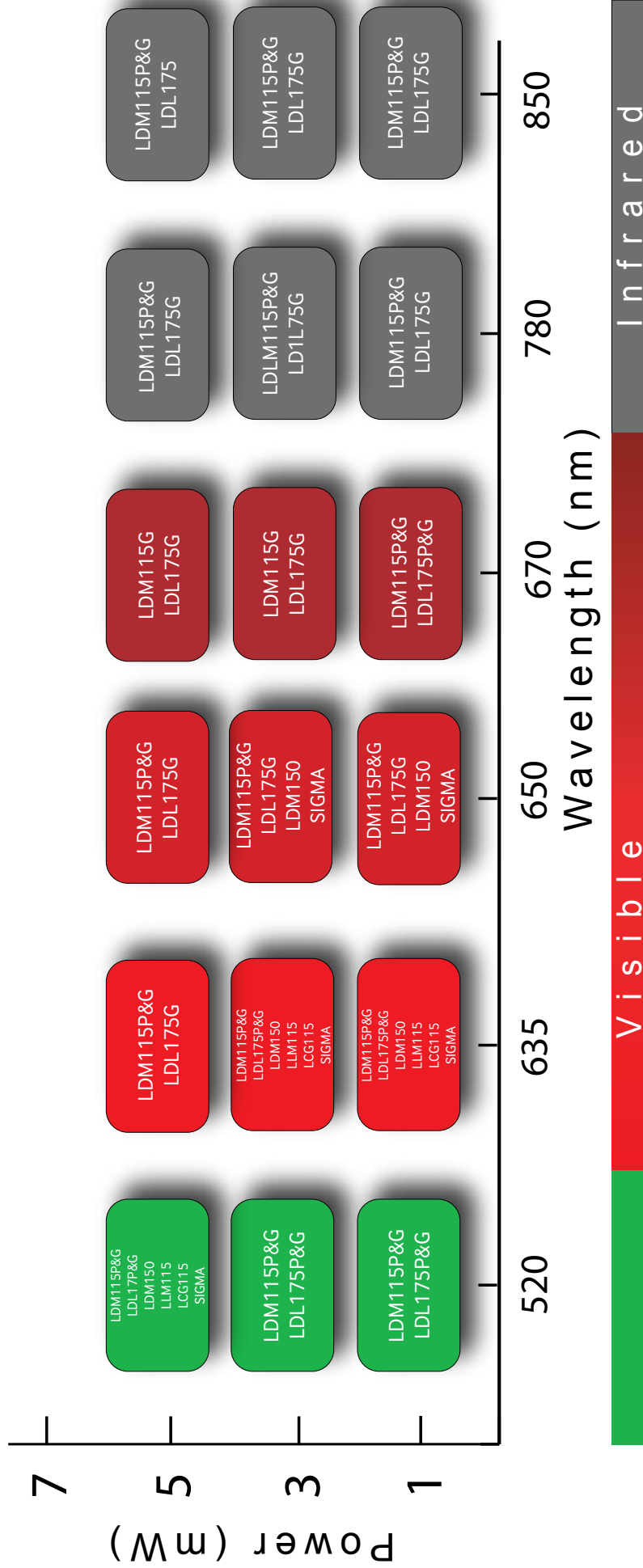
Diameter : 11mm

Length : 37mm

The LLM is an 11mm diameter laser module with an internal line generator which produces a Gaussian line with a typical fan angle of  $54^\circ$ . It is available in wavelengths of 520nm and 635nm with powers up to 5mW. It also features the electrically isolated housing and user adjustable focus. An optional TTL enable input is also available.

# Product Matrix

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



# Specification

	SIGMA	LDM150	LDL175
<b>Mechanical Specification</b>			
Mass (grams)	8	3	55
Dimensions (mm)	10.41 x 16.5	7 x 27.4	Visible - 25 x 58
			NIR & IR - 25 x 67
Housing Material	Brass	Anodised Aluminium	Anodised Aluminium
Isolated Body	Yes	Yes	Yes
Input Lead	Red Lead: (+Ve)	Red Lead: (+Ve)	1 via DC Jack Centre Pin: (+Ve) Outer: (0V)
	Black Lead: (0V)	Black Lead: (0V)	
	Blue Lead: Optional TTL	Blue Lead: Optional TTL	
Lead Length (mm)	205	220	n/a
<b>Optical Options</b>			
G Lens	No	No	Yes
P Lens	No	No	Yes
A Lens	No	Yes	No
Sigma Lens	Yes	No	No
Line Generating Optic (LGO)	No	No	No
Internal Line Optic (54° Fan Angle)	No	No	No
Internal Cross Optic (30° Fan Angle)	No	No	No
<b>Environmental Information</b>			
Operating Case Temperature (°C)	-10 to +45*	-10 to +45*	-10 to +45*
Storage Temperature (°C)	-10 to +85	-10 to +85	-10 to +85
Operating Humidity (%RH)	90	90	90
<b>Dynamic Output</b>			
Frequency Range	≤1Khz (red models) ≤10Khz (green model)	≤1Khz (red models) ≤10Khz (green model)	N/A
<b>Electrical Specification</b>			
Input Voltage +Ve (Vdc)	+3.5 to +5.0 (red models) +10 ±5% (green model)	+3.5 to +5.0 (red models) +10 ±5% (green model)	+3.5 to +5.0 (red & IR models) +10 ±5% (green model)
Input Voltage GND (Vdc)	0	0	0
TTL Input	Off < 50mV on > 2.0V	Off < 50mV on > 2.0V	n/a
TTL Modulation	n/a	n/a	n/a
Reverse Polarity Protection	Yes	Yes	Yes
Typical Operating Current @ 25°C (mA)	20 to 60*	20 to 60*	20 to 90*
Connector Type	Flying Leads	Flying Leads	DC Jack
Optional Mains Adaptor	No	No	Yes

## NOTES

\*Varies with models. Please call us for individual data.

# Specification

	LLM115	LCG115	LDM115
<b>Mechanical Specification</b>			
<b>Mass (grams)</b>	9	9	G Lens 9.5
			P Lens 10.5
<b>Dimensions (mm)</b>	11 x 37	11 x 37	G Lens 11 x 37
			P Lens 11 x 47
<b>Housing Material</b>	Anodised Aluminium	Anodised Aluminium	Anodised Aluminium
<b>Isolated Body</b>	Yes	Yes	Yes
<b>Input Leads</b>	Red Lead: (+Ve)	Red Lead: (+Ve)	Red Lead: (+Ve)
	Black Lead: (0V)	Black Lead: (0V)	Black Lead: (0V)
	Blue Lead: Optional TTL Input	Blue Lead: Optional TTL Input	Yellow Lead: Optional TTL Modulation
<b>Lead Length (mm)</b>	230	230	215
<b>Optical Options</b>			
<b>G Lens</b>	No	No	Yes
<b>P Lens</b>	No	No	Yes
<b>A Lens</b>	No	No	No
<b>Sigma Lens</b>	No	No	No
<b>Line Generating Optic (LGO)</b>	No	No	Yes
<b>Internal Line Optic (54° Fan Angle)</b>	Yes	No	No
<b>Internal Cross Optic (30° Fan Angle)</b>	No	Yes	No
<b>Environmental Information</b>			
<b>Operating Case Temperature (°C)</b>	-10 to +45*	-10 to +45*	-10 to +45*
<b>Storage Temperature (°C)</b>	-40 to +85	-40 to +85	-40 to +85
<b>Operating Humidity (%RH)</b>	90	90	90
<b>Dynamic Output</b>			
<b>Frequency Range</b>	≤1Khz (red models) ≤10Khz (green model)	≤1Khz (red models) ≤10Khz (green model)	≤1Khz (red & IR models) ≤10Khz (green model)
<b>Electrical Specification</b>			
<b>Input Voltage +Ve (Vdc)</b>	+3.5 to +5.0 (red models) +10 ±5% (green model)	+3.5 to +5.0 (red models) +10 ±5% (green model)	+3.5 to +5.0 (red & IR models) +10 ±5% (green model)
<b>Input Voltage GND (Vdc)</b>	0	0	0
<b>TTL Input</b>	Off < 50mV on > 2.0V	Off < 50mV on > 2.0V	n/a
<b>TTL Modulation</b>	n/a	n/a	Off < 50mV on > 2.0V
<b>Reverse Polarity Protection</b>	Yes	Yes	Yes
<b>Typical Operating Current @ 25°C (mA)</b>	20 to 60*	20 to 60*	20 to 140*
<b>Connector Type</b>	Flying Leads	Flying Leads	Flying Leads
<b>Optional Mains Adaptor</b>	No	No	No

## NOTES

\*Varies with models. Please call us for individual data.



# Optical Information

## Lens Information

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

<b>G Lens Type</b>	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
<b>P Lens Type</b>	Plastic Lens The long focus plastic lens with a low numerical aperture yields good quality circular collimated beams over larger distances.
<b>A Lens Type</b>	Aspheric Plastic Lens High performance general purpose lens producing good quality spots. Suitable for the range of small body modules only (LDM150 only).

	G Lens	P Lens	A Lens	Sigma
<b>Focus Range</b>	35mm to infinity	150mm to infinity	50mm to infinity	35mm to infinity
<b>Beam Size @ Aperture (mm)</b>	4 x 2*	5 x 5*	3 x 1*	4 x 1*
<b>Beam Divergence (mrad)</b>	<0.5	<0.5	<0.5	<1.2
<b>Bore Sighting (mrad)</b>	<25	<25	<25	<25
<b>Minumum Spot Size (µm)</b>	<25	<50	<40	<40

\*Varies with model

## Optional Line Generating Optics (LDM115 Only)

LGO's are designed to simply slip over the end of the LDM115 and are secured in place by tightening a small locking screw. The focus position of the line is adjusted by rotating the lens on the LDM115 module prior to the installation of the LGO to give a highly defined thin line of laser light.



	LGO
<b>Fan Angle</b>	15°, 28°, 40°, 60° & 120°
<b>Operational Wavelength (nm)</b>	520 to 850
<b>Typical Line Width @ 1 Metre (mm)</b>	0.75
<b>Length (mm)</b>	24
<b>Diameter (mm)</b>	17
<b>Mass</b>	8
<b>Length With LDM115 (grams)</b>	51
<b>Diameter With LDM115 (mm)</b>	17
<b>Mass With LDM115 (grams)</b>	17.5

# Lifetime

The case temperature should be kept within the specified range at all times, failure to do this could result in shortened lifetime or diode failure. As a guide, laser diode lifetime decreases by a factor of two (approx) for every ten degree increase in operating temperature.

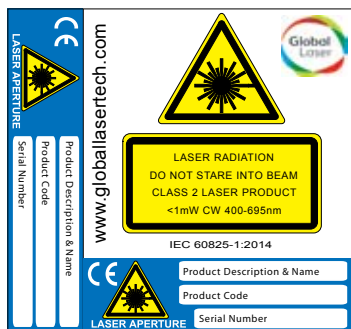
Below is a list of the available standard wavelengths for each model and the relevant MTTF specified in hours. All data was measured at 25°C.

		520nm	635nm	650nm	670nm	780nm	850nm
<b>Imatronic Models</b>	<b>SIGMA</b>	≥40,000	≥30,000	≥50,000	n/a	n/a	n/a
	<b>LDM150</b>				≥120,000	≥90,000	≥88,000
	<b>LDL175</b>			n/a	n/a	n/a	
	<b>LLM115</b>			≥50,000	≥120,000	≥90,000	≥88,000
	<b>LCG115</b>						
	<b>LDM115</b>						

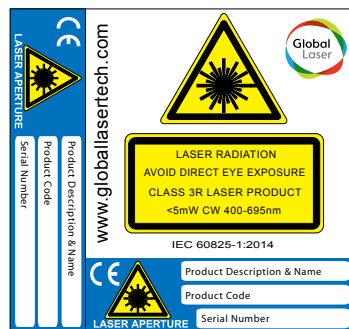
**Please Note:** This is the minimum MTTF for each wavelength. Other models may have a longer MTTF. Please call us for individual data.

# Laser Safety

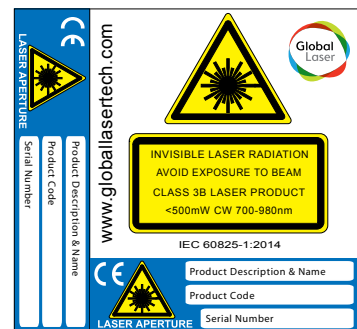
These laser diode modules are classified in accordance with IEC60825-1 2014, which should be consulted prior to designing or using any laser product. The following labels are supplied for attachment to the customer's equipment, but responsibility for compliance with the standard remains with the user.



Class 2 Label



Class 3R Label



Class 3B Label

# Options & Accessories

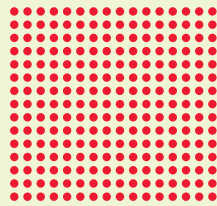
The Imatronic range has a wide range of options to suit a variety of applications. These options include projection optics, mounting clamps, power supplies, rail systems and laser safety glasses.

## Projection Options (LDM115 Only)

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



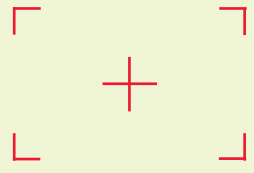
Circle with center dot



Dot Array



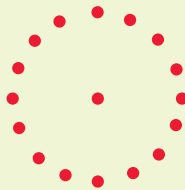
Dot Lines



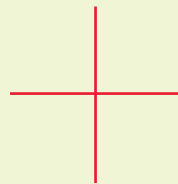
Viewfinders



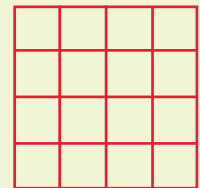
Multiple Lines



Dot Circle



Cross



Grids

## Mounting Clamps (LDM115, LCG115, LLM115 & LDL175 Only)

A number of mounting clamps are available for the Imatronic range including a heavy duty mounting clamp which allows the laser to be securely fixed at any required direction or angle. The swivel clamp offers the user up and down movement as well as  $\pm 45^\circ$  horizontal swivel. The base plate of both clamps have a series of holes which allows the clamp to be fixed directly onto a machine or workbench. The MK1 mounting clamp rotates horizontally through  $360^\circ$  and vertically through  $180^\circ$  and the mounting post allows vertical movement. For more information on any of the options please refer to the Accessories Datasheet.



Swivel Clamp



Heavy Duty Clamp



MK1 Clamp



Magnetic Base

## Power Supplies and Leads (LDL175 Only)

The LDL can be supplied with a mains adaptor which runs on 110-240Vac input via an IEC mains lead (supplied) and has one output to power the laser. A lead to connect the LDL175 to the power adaptor is also required. The standard length is 1.5 meters. If you require a custom lead length please contact us (for more information please see our accessories datasheet).



110 / 240 Vac Power adaptor



Power Leads

## Laser Safety Glasses

To compliment the Imatronic range there are a number of laser safety glasses, below is an example of some of the available glasses (colours may vary). For more information on any of the options please refer to the Laser Safety Glasses Datasheet.



AL3 - Protection against Green  
(Visible Alignment)



DIA - Protection against Red  
(Visible Alignment)



YG2- Protection against IR Laser  
(Block Out)

## Mounting Rails

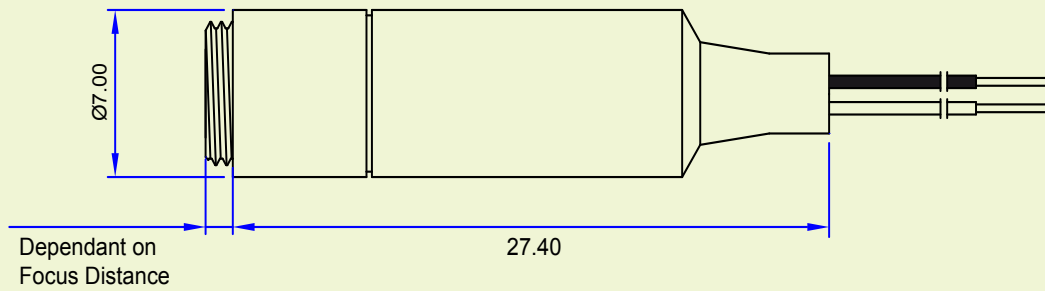
The rail and carriage system can either be manual or motor-driven. The carriages are translated either by hand or computer and then locked into position. All Global Laser rail and carriage systems incorporate long-life and low friction polymer bearings that are self-lubricating. The rails are hard anodized to increase their ruggedness and also available in stainless steel. This makes the systems ideal for aggressive environments with high levels of dirt and dust or areas subject to wash down or high levels of moisture.



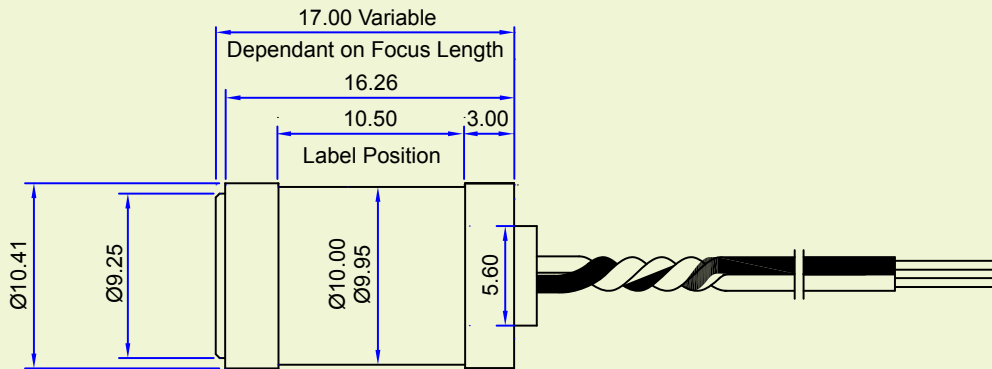
Rail and Mounting Clamp

# Dimensional Information

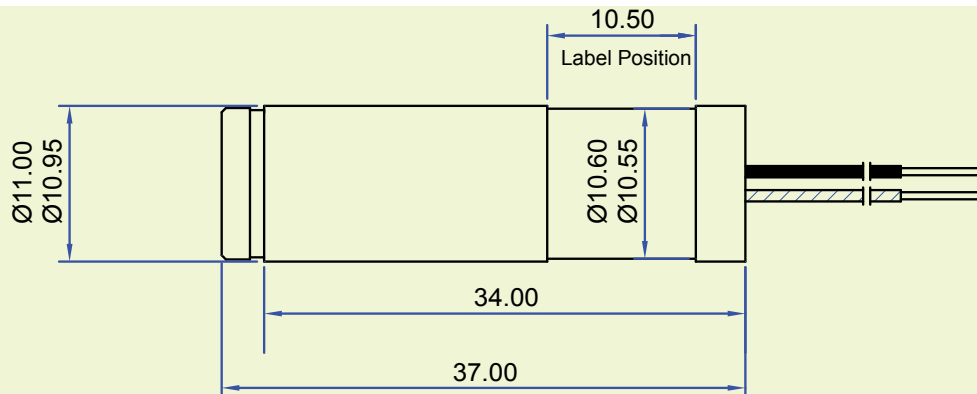
## LDM150



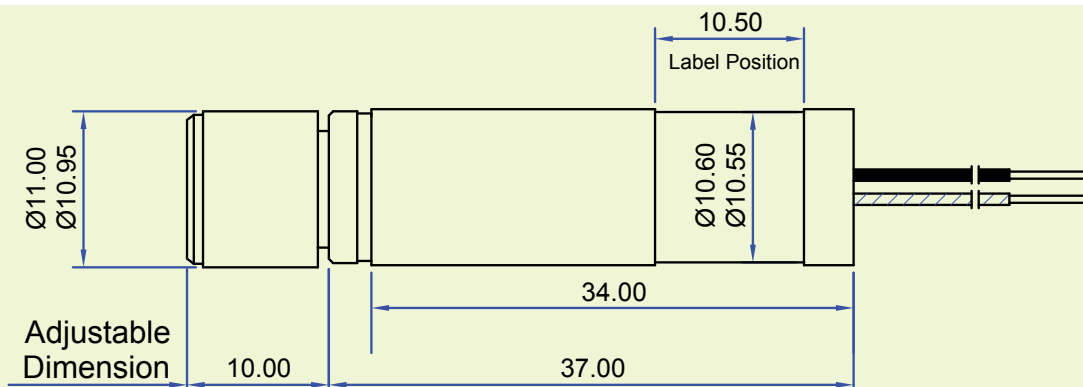
## SIGMA



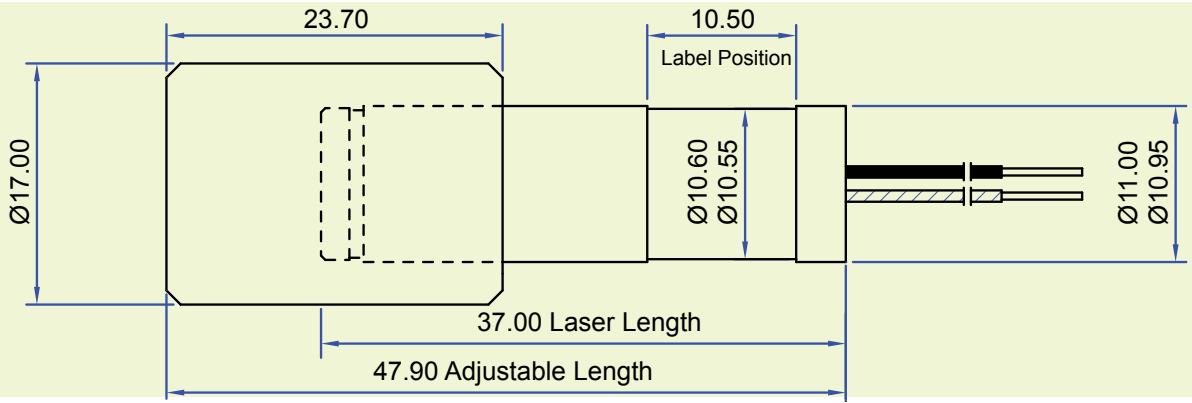
## LDM115



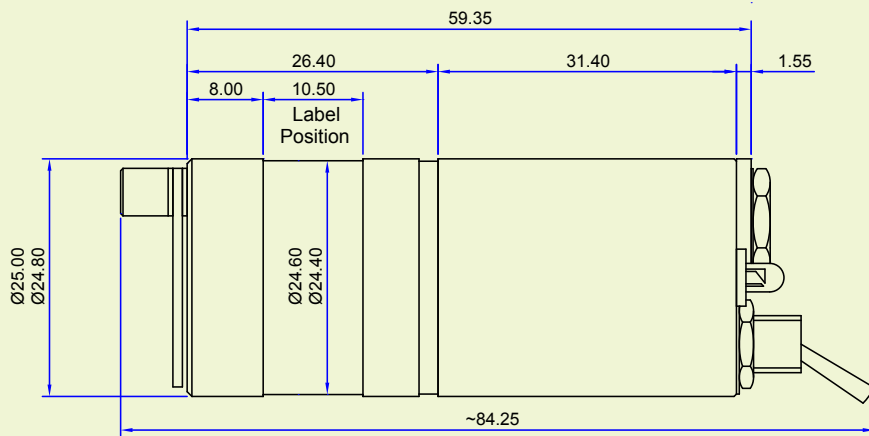
## LDM115 Fitted With P Lens



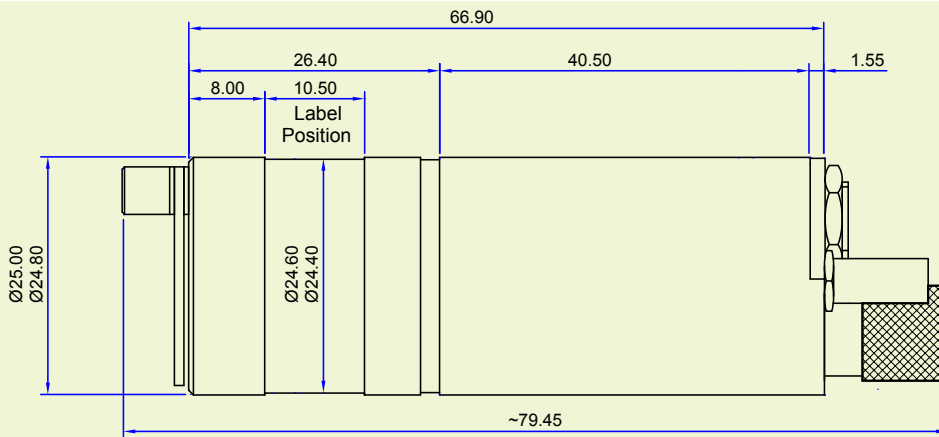
LDM115 fitted with LGO



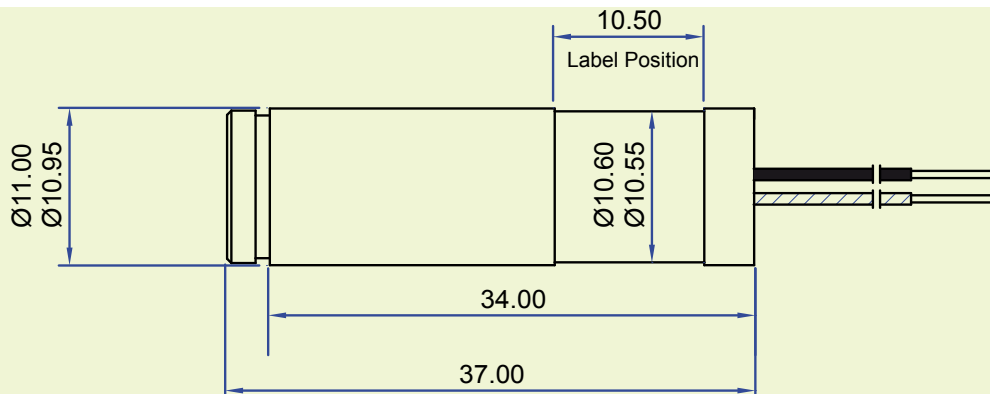
LDL175



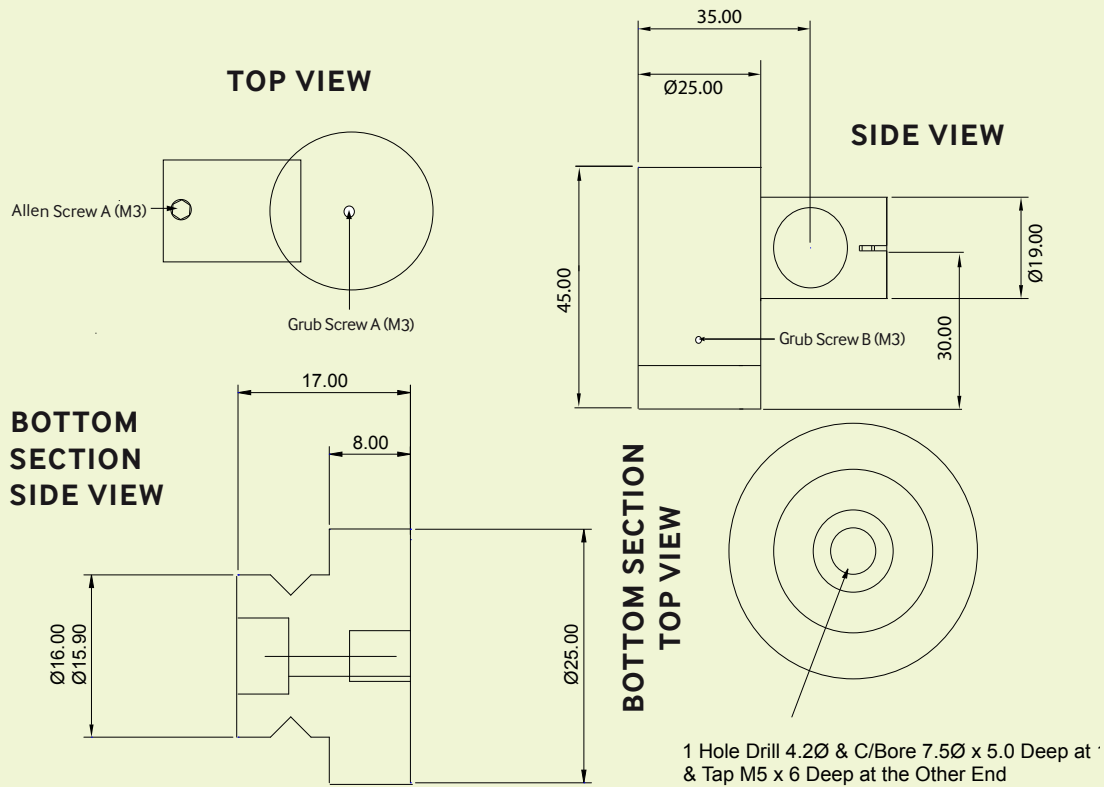
LDL175 (With Interlock)



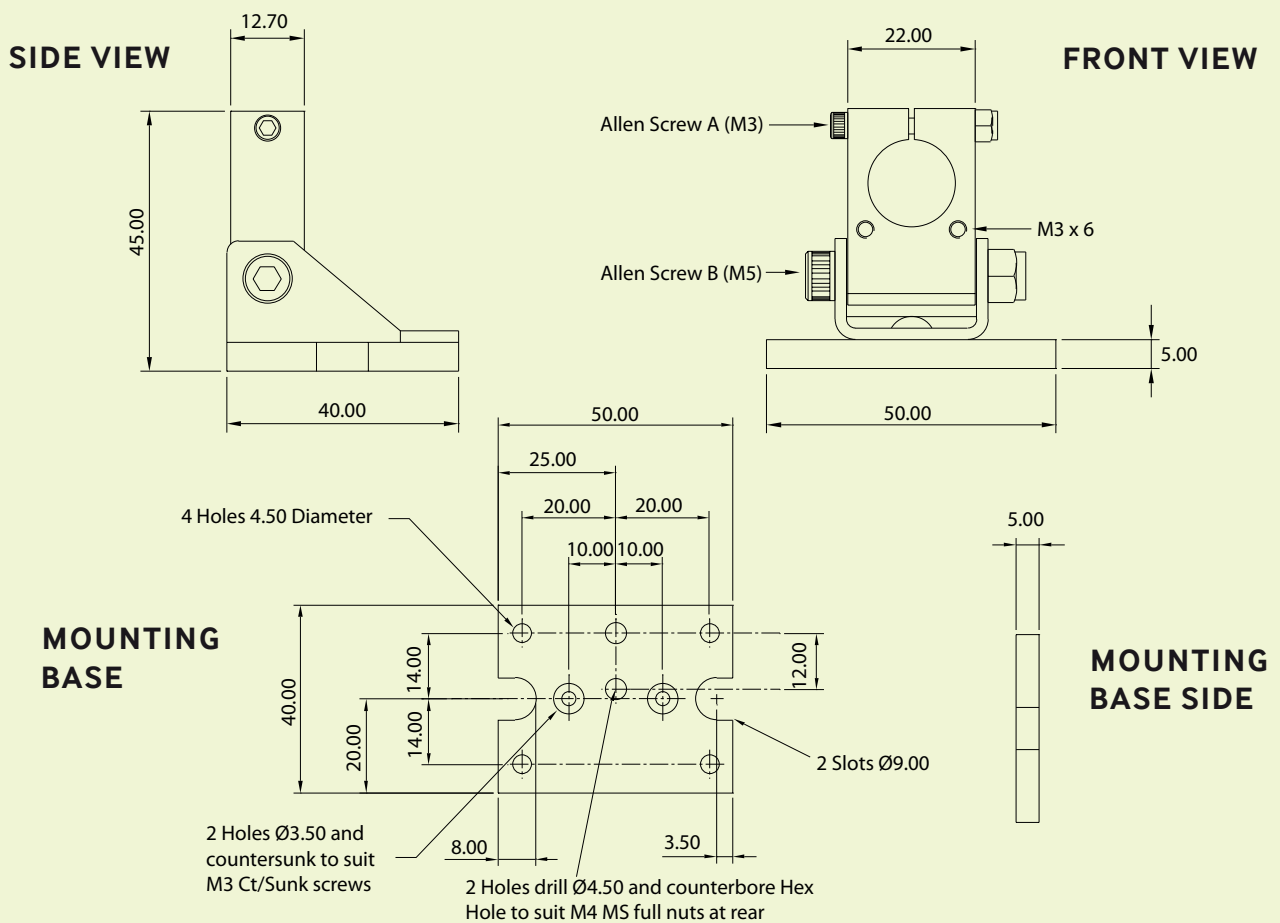
LLM & LCG



## Heavy Duty Mounting Clamp

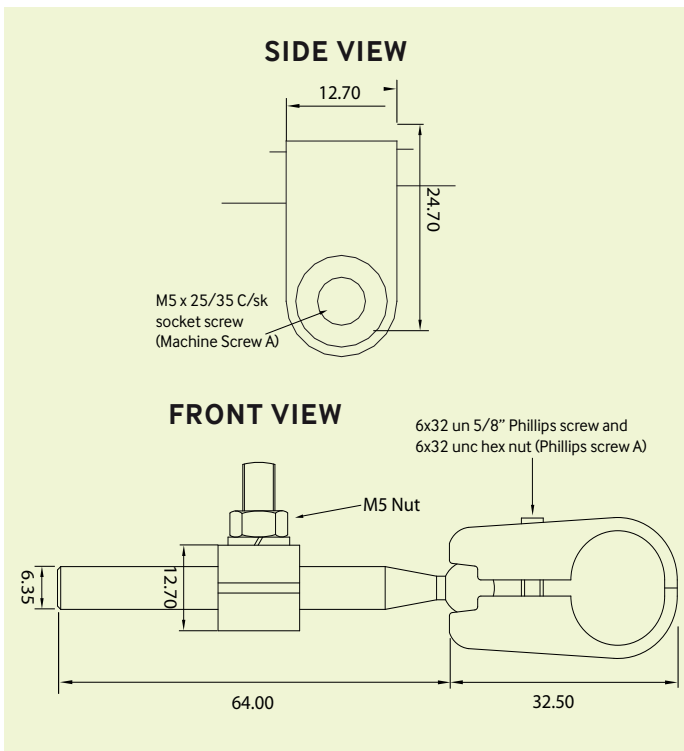


## Swivel Mounting Clamp

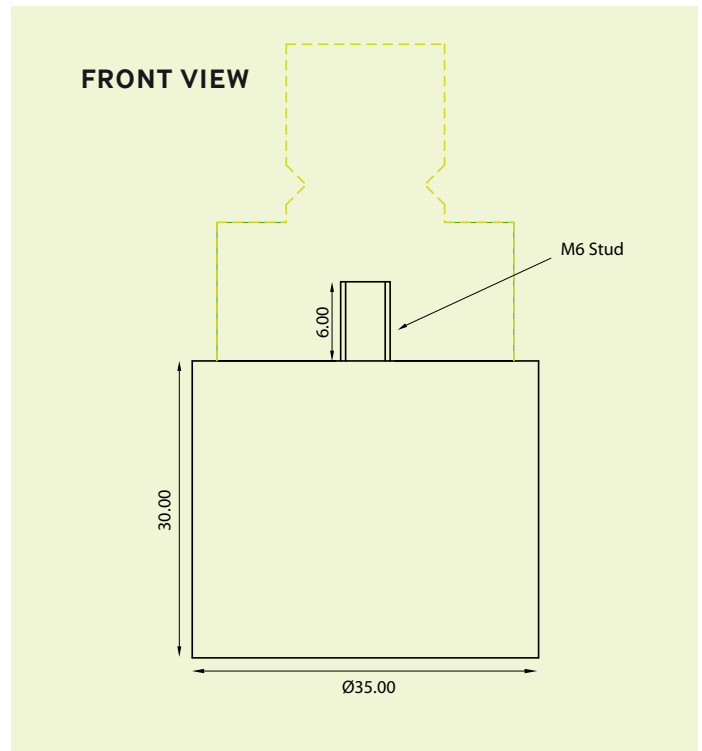


Drawings are not to scale.

## MK1 Mounting Clamp



## Magnetic Base



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



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:

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