The Machine Vision Range of Lasers

Lyte-MV, Lyte-MV-EXCEL & GreenLyte-MV-EXCEL

The Machine Vision Range

The Lyte-MV range of laser diode modules provides reliable high power, industrial laser light sources with well-defined line illuminations. Used primarily with industrial cameras, they are suitable for a wide range of inspection, measurement and control systems.

The Lyte-MV range is available in blue, green, red and infrared wavelengths with powers up to 200mW. The range of modules are qualified to European specifications and are one of the most controllable lasers in the machine vision market.

A wide range of options and accessories are available including mounting kits, power supplies and projection options.

Selection Guide

This catalogue covers the complete Lyte-MV range of laser diode modules and is broken down into various sections. Please use the guide below to go straight to the relevant section.

Lyte-MV & Lyte-MV-EXCEL

The main features of the **Lyte-MV**:-
- Uniform non-Gaussian line with fan angles from 5° to 75°
- Powers up to 75mW in Blue, 120mW in red and 200mW in I/R
- CW, Linear modulation or TTL control
- Excellent focus & line quality
- Rugged design
- Case electrically isolated
- Qualified to EN61000
- Wide range of line projection options
- User adjustable focus

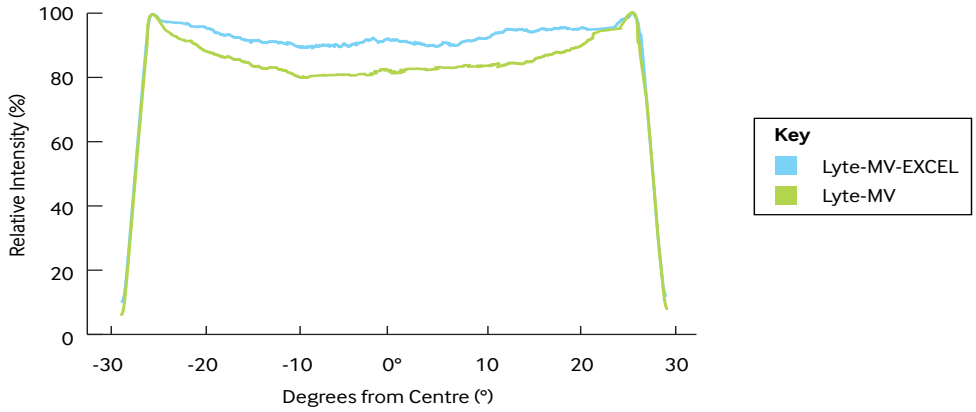
The main features of the **Lyte-MV-EXCEL**:-
- The Lyte-MV-EXCEL has all the features of the Lyte-MV plus the following.
- Unique user adjustable focus without removing line optics
- Laser classification maintained during focus adjustment
- Improved line thickness
- Accurately aligned

The Lyte-MV range is certified to a wide range of European testing. Please see our website for further information.

Output Specification

Uniform Intensity

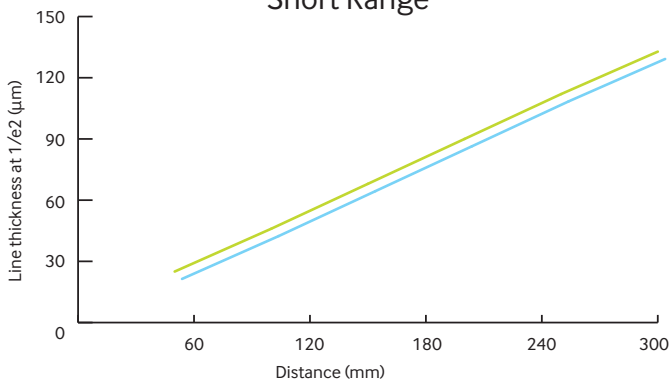
The following profile shows the typical intensity along the length of the line. The uniform power distribution in the centre with sharp ends makes this laser suitable for use with a wide range of commercial CCD cameras.



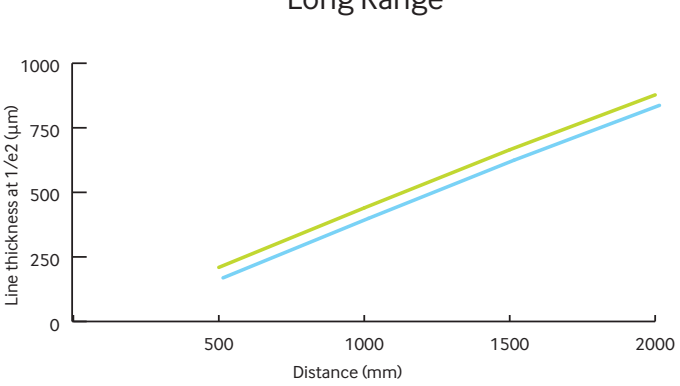
Focusing and depth-of-field characteristics

The following charts show the typical focusing and depth-of-field performance of the Lyte- MV in comparison with the Lyte-MV-EXCEL. The focus charts indicate the minimum line thickness (at $1/e^2$) achievable for a specific projection distance. The depth-of-field is defined as the distance between two points either side of the pre-set focus at which the line width increases by a factor of $\sqrt{2}$.

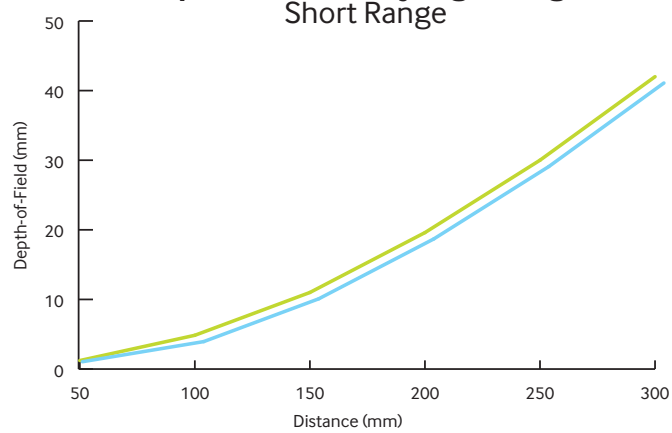
Focusing
Short Range



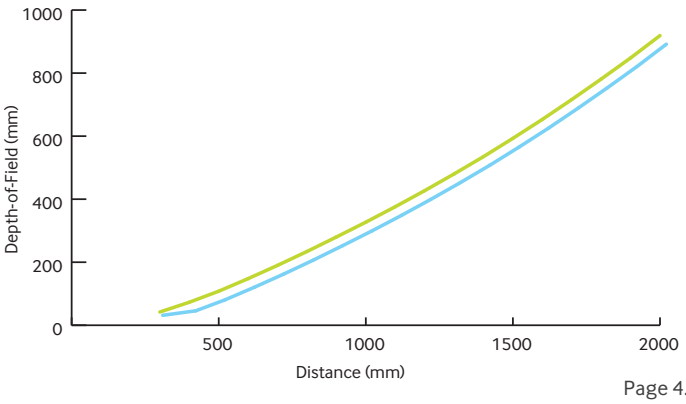
Focusing
Long Range



Depth-of-Field (Rayleigh Range)
Short Range



Depth-of-Field (Rayleigh Range)
Long Range



GreenLyte-MV-EXCEL

The main features of the **GreenLyte-MV-EXCEL**:-

- Highly visible green line
- Stable power without thermoelectric (TE) cooling
- Uniform non-Gaussian line with fan angles from 5° to 75°
- CW, Linear modulation or TTL control
- Unique user adjustable focus without removing line optics
- Laser classification maintained during focus adjustment
- Electrically isolated case
- Powers up to 50mW
- Low operating current
- Rugged design
- High boresight accuracy

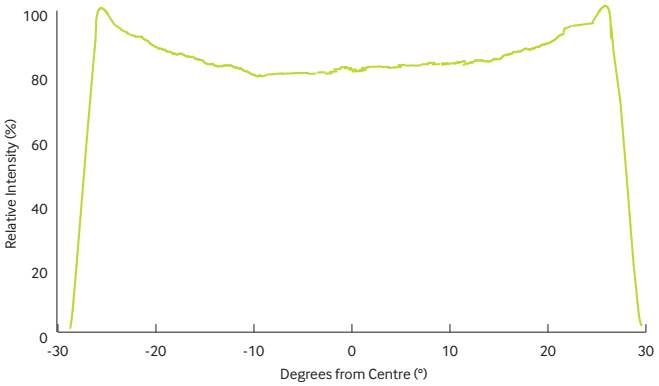
Suitable applications include:

Automotive
Ceramics
Timber & Packaging
Aerospace
Triangulation
Tomography
Alignment
Inspection

Output Specification

Uniform Intensity

The following profile shows the typical intensity along the length of the line. The uniform power distribution in the centre with sharp ends makes this laser suitable for use with a wide range of commercial CCD cameras.

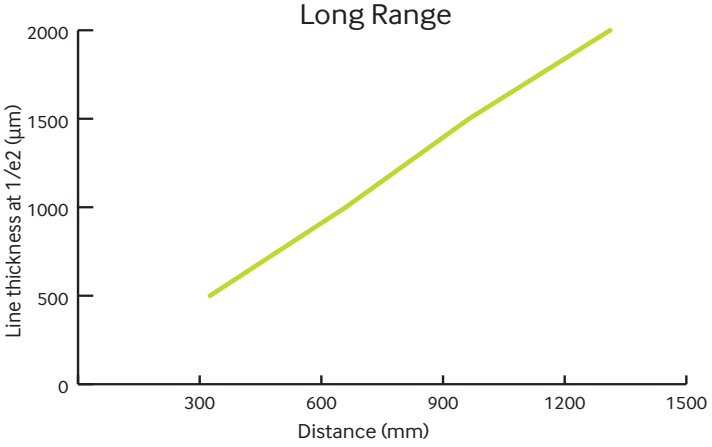


Focusing and depth-of-field characteristics

The following charts show the typical focusing and depth-of-field performance of the GreenLyte-MV-EXCEL laser. The focus charts indicate the minimum line thickness (at $1/e^2$) achievable for a specific projection distance. The depth-of-field is defined as the distance between two points either side of the pre-set focus at which the line width increases by a factor of $\sqrt{2}$.

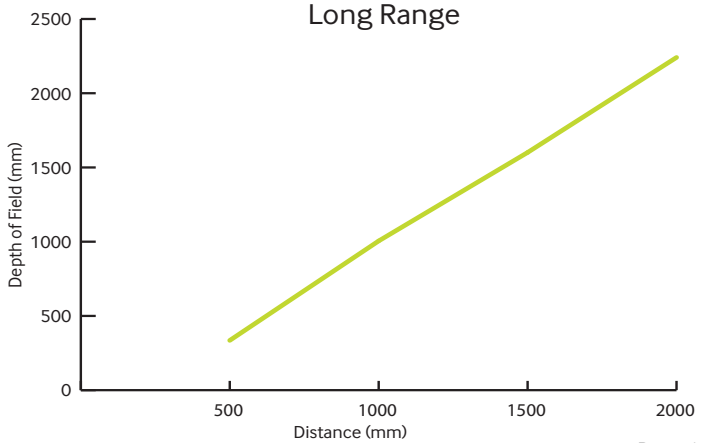
Focusing
Short Range

Focusing
Long Range



Depth-of-Field (Rayleigh Range)
Short Range

Depth-of-Field (Rayleigh Range)
Long Range



Specifications

	Lyte-MV	Lyte-MV-EXCEL	GreenLyte-MV-EXCEL
Mechanical Information			
Weight (grams)	44	52	74
Diameter (mm)	19		
Length (mm)	73.5	88	108
Material	Bronze Anodised Aluminium		Green Anodised Aluminium
Isolated Body	Yes		
Input Leads	4 Leads, / Red (+Ve) / Black (0V) / Yellow (Control) / Blue (Enable Switch)		
Lead Length (mm)	300		
Optical Information			
Wavelength (nm)	**Power** (mW)	**Power** (mW)	**Power** (mW)
405	15, 30, 50, 75	N/A	N/A
532	N/A	N/A	5, 10, 20, 35, 50
635	1, 5, 10, 15, 35	5, 10, 15, 35	N/A
650/660	1, 5, 10, 20, 35, 50, 100, 120	5, 10, 20, 35, 50, 100, 120	N/A
670	1, 5, 10	5, 10	N/A
685	20, 50	20, 50	N/A
785	5, 20, 35, 50, 75, 90	5, 20, 35, 50, 75, 90	N/A
808	200	200	N/A
850	5, 30	5, 30	N/A
980	50	50	N/A
Custom	Please call with your requirements		
Intensity Distribution (Uniform Line)	Uniform along length, Gaussian along width		
Fan Angles (°)	5, 10, 20 ,30, 45, 60, 75 (Others available upon request)		
Line Thickness	Refer to focus charts on product information		
Bore Sighting (mRad)	<3*	<3	
Minimum Working Distance (mm)	N/A		160
Turn on time to 75% of full power (s)	N/A		<30
Environmental Information			
Operating Case Temperature (°C)	-10 to +45**		+5 to +35
Storage Temperature (°C)	-10 to +80		
IOperating Humidity (%RH)	90 (non condensing)		
Electrical Specifications			
Input Voltage (Vdc)	5.0Vdc ±500mV 10Vdc ±500mV (405nm lasers only)		3.5 to 5.0
Connector Type	4 Pin Binder		
Reverse Polarity Protection	Yes		
Internal Current Limiter	Yes		

NOTES
* = At factory set focus, ** = Varies with laser diode type
All Specifications are typical @ 25 °C

Modulation

The Lyte-MV range of lasers has two options of modulation available. These are Analogue Modulation and Digital TTL Modulation.

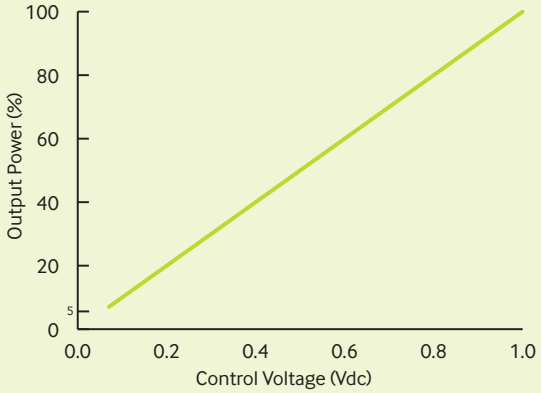
Version: Analogue A

Intensity Control Function

This function allows the user to adjust the output power via the control lead, it is linearly controlled from the maximum factory set power to off.

Power Adjustment Chart

0 V = Off
1 V = Max Power



Modulation & Synchronization

The laser may be modulated or synchronised to a camera by using an external signal. (Voltage range 0 to 1Vdc)
Frequency Range of Lyte-MV and Lyte-MV-EXCEL = DC to 200kHz *
Frequency Range of Greenlyte-M-EXCEL = DC to 10kHz *

Please note: Intensity control and modulation functions may be used together.
** = Measured at 90% modulation depth, sine wave to -3dB*

Version: Digital D

The Digital TTL driver board allows the unit to be gated on and off, or pulse-width modulated at TTL voltage levels via the control lead. Two versions are available either non-inverting TTL or inverting TTL. For non-inverting < 0.4V = off and > 2V = on and vice versa for the inverted model.

Lyte-MV and Lyte-MV-EXCEL
Rise Time: < 0.5µs (Typically)
Fall Time: < 0.5µs (Typically)

GreenLyte-MV-EXCEL
Rise Time: < 10µs (Typically)
Fall Time: < 10µs (Typically)

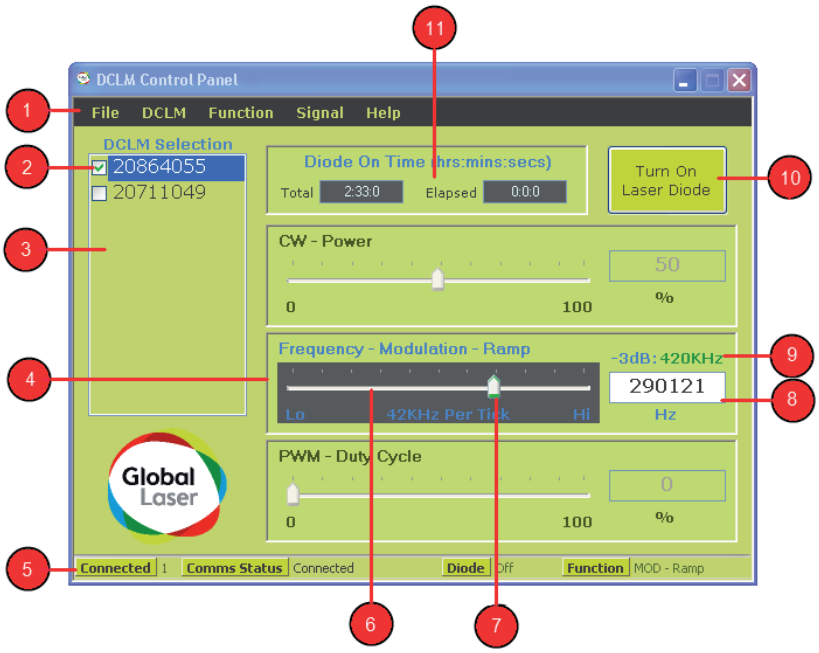
Lyte-MV DCLM Information

Lyte-MV DCLM

The laser can be powered via a USB port on a computer or USB hub without the need for any external power supply. The included software provides a user friendly graphical interface. This allows the user to control of the level of laser output powered from factory power set to off. Alternatively the output can be modulated via a sine or triangle wave with the signal type or modulation frequency simply controlled via a menu in the control software which programs an on board function generator. The output can also be switched on and off via TTL or PWM with the frequency and duty cycle all controlled from the software. PWM can also be used at a fixed frequency with the duty cycle also controlled from the software.

Lyte-MV DCLM: User Interface

The user interface is the central point where you can control and operate the DCLM. The image below shows the control panel and the information that can be displayed.



1 Main Menu Bar.
2 Selected DCLM
3 DCLM Selection List Box
4 Function Control Group
5 Status Bar
6 Slide Control Bar
7 Slide Control Tab
8 Function Control Data Box
9 Maximum Frequency at -3dB Point
10 Turn DCLM Laser On/Off button
11 Diode on Time Display Panel

Dynamic Link Library (DLL)

For customer wishing to interface the Lyte-MV DCLM with their own software , we have developed a DLL for this purpose. The DLL is compatible with Windows XP/Vista & 7 in both 32 & 64 bit versions. It is included on the Software CD that is supplied with the laser. For more information please refer to the DCLM DLL Userguide.

NOTES

The DCLM options is only available in the Lyte-MV body and only certain wavelegth and power combinations . Please contact us with your requirements.

Lyte-MV DCLM Specification

Mechanical Information				
Weight (grams)	44			
Diameter (mm)	19			
Length (mm)	73.5			
Material	Hard Anodised Aluminium			
Isolated Body	Yes			
Connector Type	USB			
Optical Information				
Wavelength (nm)	635 to 980 & Custom Upon Request			
Power (mW)	Up to 200 as standard (Custom Upon Request)			
Driver Type	APC			
Power Stability (Over Temperature Range)	±3%			
Optical Output Option	Spot, Uniform Line and Diffractive Projections			
Intensity Distribution (Uniform Line)	Uniform along length, Gaussian along width			
Uniformity (Uniform Line)	±25% (Over central 80% of the line)			
Fan Angles (°)	5, 10, 20 ,30, 45, 60, 75 (Others available upon request)			
Line Thickness	Refer to focus charts on product information			
Bore Sighting (mRad)	<3 *			
Focus Adjustment	User Adjustable			
Environmental Information				
Operating Case Temperature (°C)	-10 to +45 (See Note 1)			
Storage Temperature (°C)	-10 to +80			
Electrical Specifications				
Input Voltage (Vdc)	Standard USB 1.1 & 2 Specification			
Operating Current (mA)	<200			
Over Current Protection	Yes			
	Sine & Triangle Wave	**TTL**	**PWM**	**Power Control**
Typical Rise & Fall Time (µs) #	N/A	≤1.9	≤1.9	N/A
Frequency Range (Khz) #	DC to 420 (See Note 3)	DC to 357	49	N/A
Power Control Range (%)	N/A	N/A	N/A	5 to 100
Duty Cycle (%)	N/A	Fixed 50/50	Variable 0-100	N/A
Signal Amplitude (%)	5 to 95	N/A	N/A	N/A

NOTES

NOTE 1: The operating case temperature range is depended on the laser diode fitted. The quoted information is the typical range. Some wavelengths and powers may have a wider operating temperature range. Please contact us for the temperature range for individual models.

NOTE 2: The modulation bandwidth is depended on the laser diode fitted. The quoted information is the minimum range. Please contact us for the bandwidth for individual models.

NOTE 3:

* At factory set focus

Varies with laser diode type and output power. This data is based on a DCLM Lyte-MV 660nm, 35mW

All Specifications are typical @ 25 °C

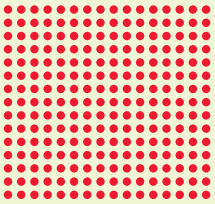
Options & Accessories

The Lyte-MV laser modules have a wide range of options to suit a variety of applications. These options include projection optics, power supplies, waterproof housing and laser safety glasses.

Projection Options

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 applications. Please see the Projection Lens Datasheet for further information.

Circle with center dot

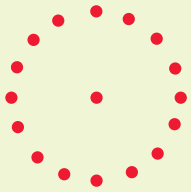


Dot Array

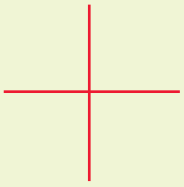
Dot Lines

Viewfinders

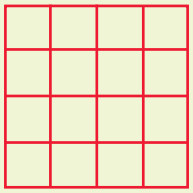
Multiple Lines



Dot Circle



Cross



Grids

Mounting Clamps

The heavy duty mounting clamp allows the Lyte-MV range 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. For more information on any of the options please refer to the Accessories Datasheet.

Heavy Duty Mounting Clamp

Magnetic Mounting Base

Power Supplies and Leads

For users that require an off the shelf power supply a 110/240 Vac power adaptor is available. For more information on any of the options please refer to the Accessories Datasheet. A range of power leads are also available ranging in length from 0.5 to 5 meters. Custom lengths are available upon request.

110 / 240 Vac Power Adaptor

Power Leads

Laser Safety Glasses

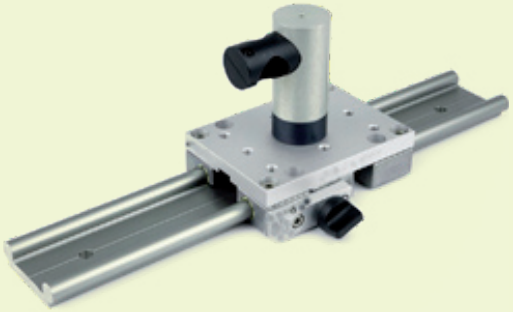
To compliment the Lyte-MV range there are a number of laser safety glasses, below is an example of some of the available glasses. For more information on any of the options please refer to the Laser Safety Glasses Datasheet.

DIA - Protection against Red 50mW

AL3 - Protection against Green 50mW

Mounting Rails

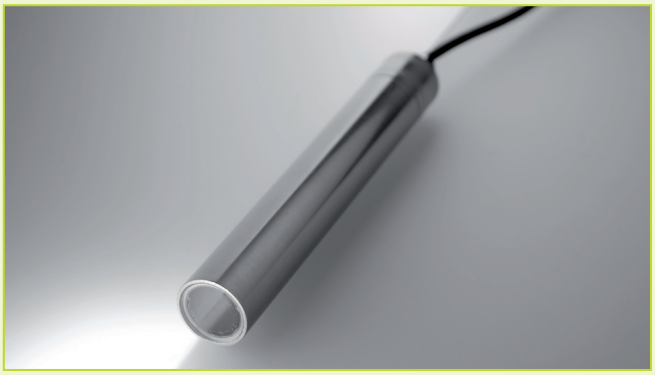
Options range from the simple slide rail system were carriages can be moved by hand and locked into position, to computer controlled, motor driven systems. All systems incorporate long life/ low friction polymer bearings which are self lubricating, removing the need for messy dirt, attracting oils and greases. All rail systems are 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

IP68 Waterproof Housing

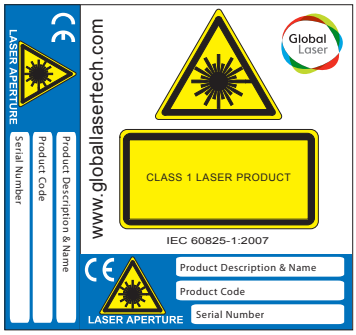
For applications where a laser will be subject to submersion in water, high pressure wash downs or there are high levels of dust, Global Laser waterproof housing provides the ideal solution. Manufactured from stainless steel 316 and certified to IP68 (dust tight and continuous submersion) it is compatible with our Lyte-MV, Lyte-MV-EXCEL and GreenLyte-MV-EXCEL range. Further flexibility is offered by the ability for the user to be able to remove the laser module from the housing and refocus the unit if required.



IP68 Waterproof Housing

Laser Safety

Our lasers are compliant to IEC 60825-1 2007 standards. The lasers fall within one of the following classifications depending on power and wavelength. Examples of the labels are below.



Class 1 Label

Class 1M Label

Class 2 Label

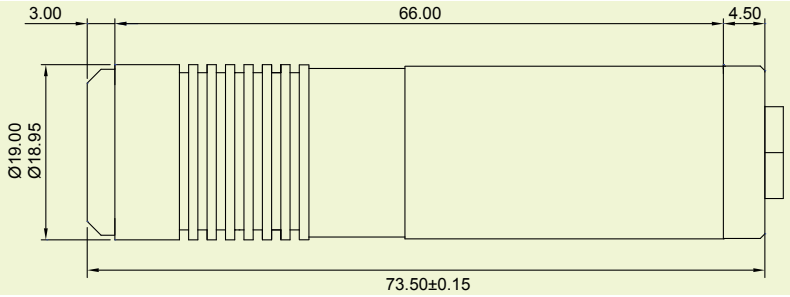
Class 2M Label

Class 3R Label

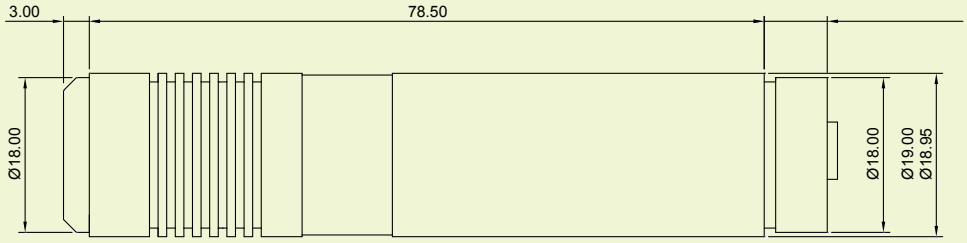
Class 3B Label

Mechanical Dimensions

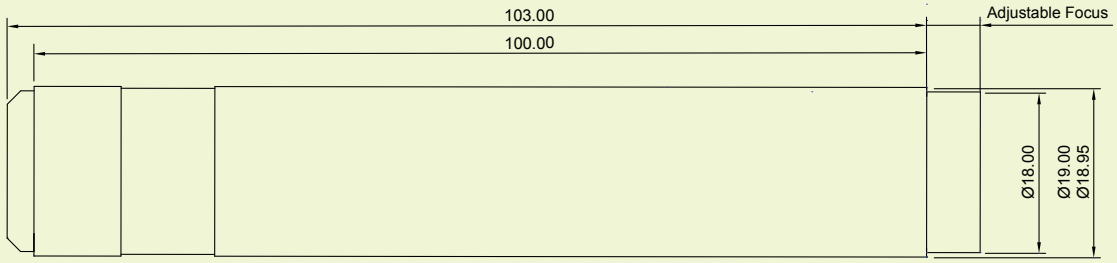
Lyte-MV



Lyte-MV-EXCEL



GreenLyte-MV-EXCEL



Drawings are not to scale

MODEL /660/50/60/A/500

- 660: Wavelength (nm)
- 50: Fan Angle (°)
- 60: Power (mW)
- A: Driver Board
  - DNI -TTL (non inverted)
  - DI - TTL (inverted)
  - A - Linear Modulation
  - DCLM - DCLM via USB
- 500: Working Distance (mm) 300mm if not specified

Please Note: Global Laser reserve the rights 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.
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