



# **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 includes the Lyte-MV, Lyte-MV-EXCEL, and GreenLyte-MV-EXCEL. Each model emits a uniform (non-Gaussian) and well-defined line with a user-adjustable focus. Its ability to evenly illuminate objects across along the entire length of the line allows the Lyte-MV range to be used successfully with industrial CCD and CMOS cameras in inspection, measurement, and control systems.

An innovative approach to structured illumination, you can easily interchange line-generating optics (LGO) and diffractive optical elements (DOE) by hand. The resulting line, shape, or pattern can assist in general machine vision and can also be used to align, position, and target objects in the automotive, aerospace, ceramics, timber, and packaging industries. Typical applications of the Lyte-MV range include triangulation, 3D mapping and surface texture analysis

Recommended for industrial environments and demanding applications, the Lyte-MV range is vibration-tested between 10-500 Hz and temperature-cycled between -20°C to +50°C. It also conforms to European EMC standards EN61000-6-4 and EN61000-6-2.

Wavelengths of violet (405nm), blue (450nm), green (520, 532nm), red (635, 650, 670, 685nm), and infrared (785, 808, 850, 980nm) are available with output powers up to 200 mW. Custom power and wavelength combinations are also available.

If you have any problems or require help when using a Lyte-MV module then please contact us through [sales@globalasertech.com](mailto:sales@globalasertech.com) or call your local representative.



# 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.

Page	Section	Description
<b>3</b>	Lyte-MV & Lyte-MV-EXCEL Features	List of key features for the Lyte-MV and Lyte-MV-EXCEL.
<b>4</b>	Output specification for Lyte-MV & Lyte-MV-EXCEL	Typical line intensity graph, focusing and depth-of-field characteristics.
<b>5</b>	GreenLyte-MV-EXCEL Features	List of key features for the GreenLyte-MV-EXCEL.
<b>6</b>	Output specification for the GreenLyte-MV-EXCEL	Typical line intensity graph, focusing and depth-of-field characteristics.
<b>7-8</b>	Specifications	A list of what powers and wavelengths are available with a uniform line.
<b>9</b>	Modulation	Detailed explanation of each modulation function available.
<b>10</b>	DCLM Information	Information on our DCLM version and the software.
<b>11</b>	DCLM Specification	Full comprehensive specification for the DCLM Lyte-MV.
<b>12-14</b>	Options & Accessories	Here you will find information on a variety of options and including.
<b>14</b>	Laser Safety	Examples of the laser safety labels that are supplied with the lasers.
<b>15</b>	Mechanical Dimensions	Detailed technical drawing of the Machine Vision range.

# 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 violet and 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

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

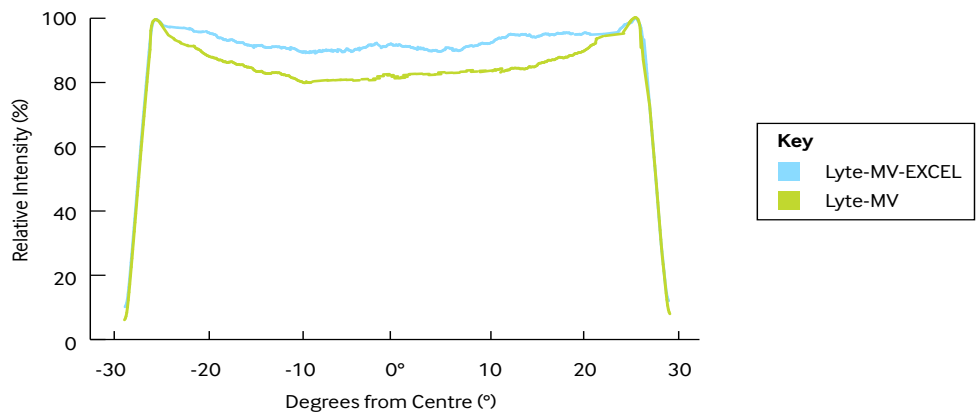
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# Output Specification

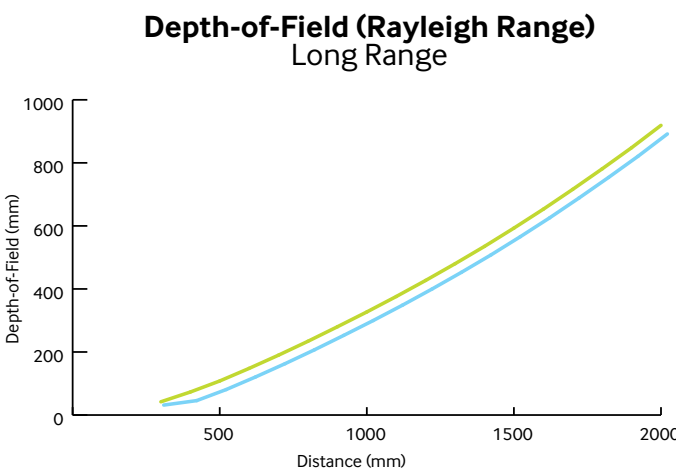
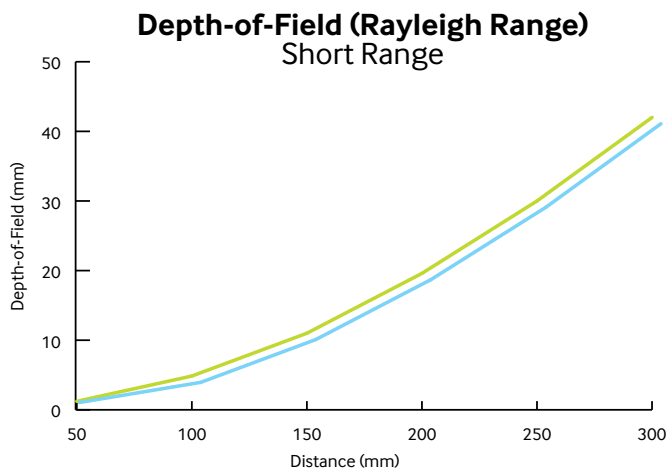
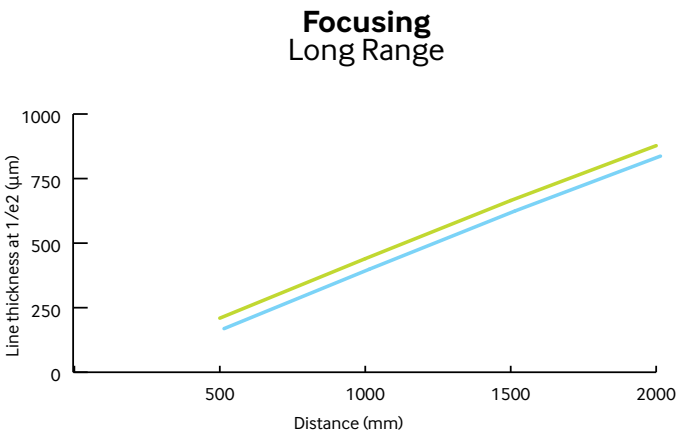
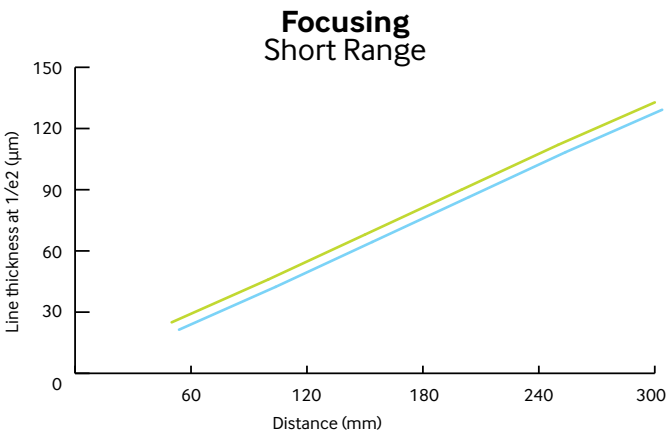
## Uniform Intensity

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  $\sqrt{2}$ .



# GreenLyte-MV-EXCEL

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

- Highly visible green (532nm) 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

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## Suitable applications include:

Automotive  
Ceramics  
Timber & Packaging  
Aerospace  
Triangulation  
Tomography  
Alignment  
Inspection

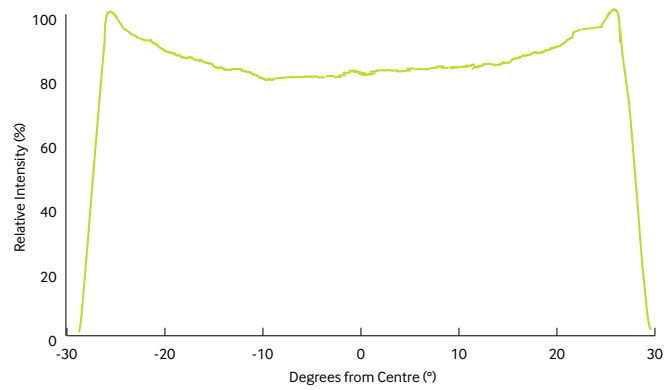
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# Output Specification

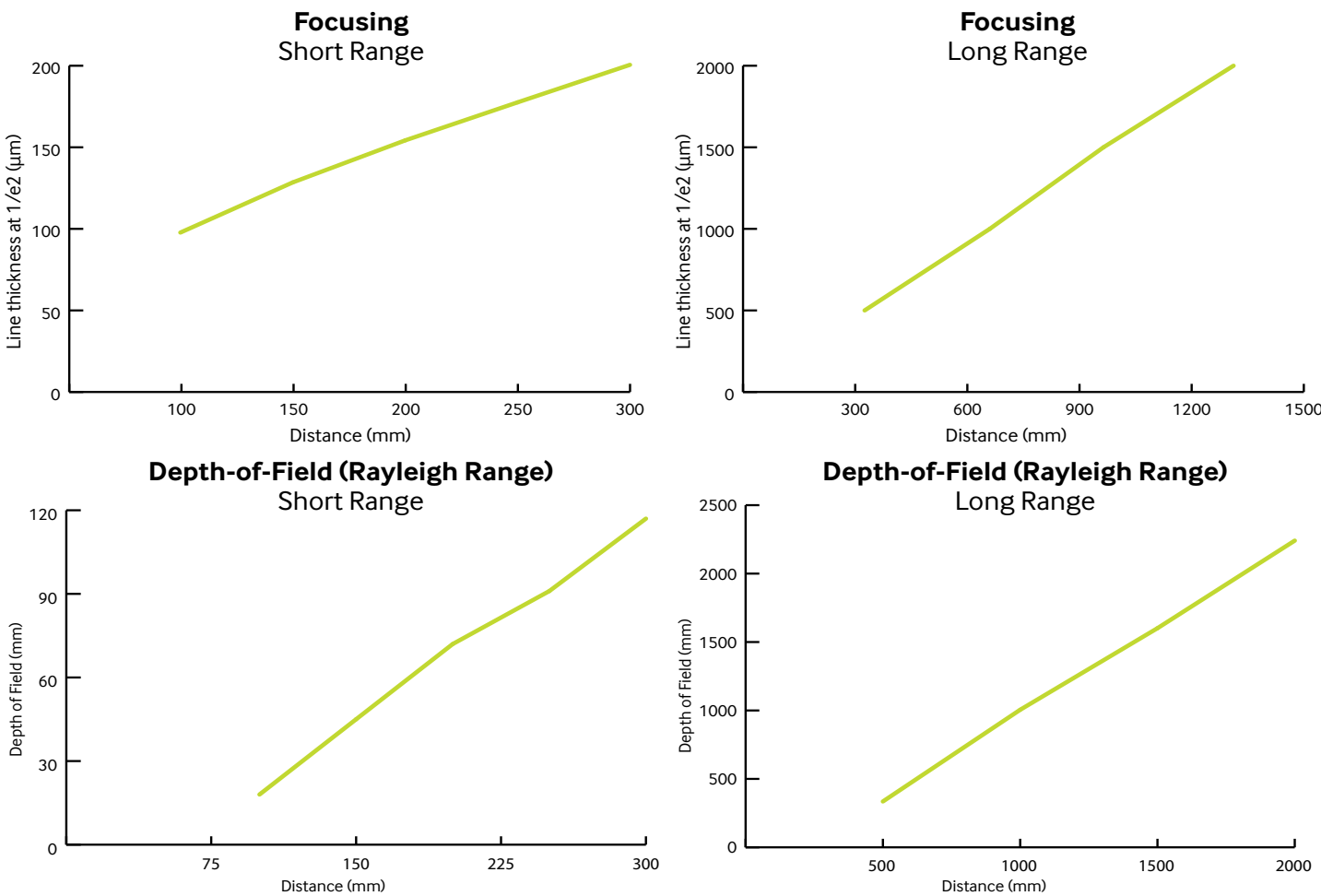
## Uniform Intensity

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  $\sqrt{2}$ .



# Specifications

	Lyte-MV	Lyte-MV 24Vdc
Mechanical Information		
Weight (grams)	44	52
Diameter (mm)	19	
Length (mm)	73.5	
Material	Bronze 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)
405	15, 30, 50, 75, 200	N/A
450	15, 30, 50, 75	N/A
520	5, 10, 50, 80	5, 10, 50, 80
635	1, 5, 10, 20, 35, 60, 200	1, 5, 10, 20, 35, 60
650/660	1, 5, 10, 20, 35, 50, 100, 120	1, 5, 10, 20, 35, 50
670	1, 5, 10	1, 5, 10
685	20, 50	20, 50
785	5, 20, 35, 50, 75, 90	5, 20, 35, 50, 75, 90
808	200	200
850	5, 30, 50, 200	5, 30
905	10	10
980	50	50
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 **	
Minimum Working Distance (mm)	Please call with your requirements	
Environmental Information		
Operating Case Temperature (°C)	-10 to +45 ***	
Storage Temperature (°C)	-10 to +80	
Operating Humidity (%RH)	90 (non condensing)	
Modulation Options		
Analogue	Yes	No
Digital	Yes	Yes
DCLM	See DCLM section for options	
Electrical Specifications		
Input Voltage (Vdc)	5.0 ±500mV 10 ±500mV (405, 450 & 520nm only)	5-30 10-30 (520nm only)
Connector Type	4 Pin Binder M8	
Reverse Polarity Protection	Yes	No
NOTES * = Wavelength tolerance can vary typically by ±10nm. ** = At factory set focus, ***= Varies with laser diode type. All Specifications are typical @ 25 °C		



# Specifications

	Lyte-MV-EXCEL	GreenLyte-MV-EXCEL
Mechanical Information		
Weight (grams)	52	74
Diameter (mm)	19	
Length (mm)	87.5	109
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)
532	N/A	5, 10, 20, 35, 50
635	5, 10, 20, 35, 60	N/A
650/660	5, 10, 20, 35, 50, 100, 120	N/A
670	5, 10	N/A
685	20, 50	N/A
785	5, 20, 35, 50, 75, 90	N/A
808	200	N/A
850	5, 30, 50	N/A
905	10	N/A
980	50	N/A
Custom	Please call with your requirements	
Intensity Distribution (Uniform Line)	Uniform along length, Gaussian along width	
Fan Angles (°)	5, 10, 15, 20, 30, 45, 60, 75 (Others available upon request)	
Line Thickness	Refer to focus charts on prduct information	
Bore Sighting (mRad)	<3 **	
User Adjustable Focus	Yes	
Minimum Working Distance (mm)	Please call with your requirements	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	
Operating Humidity (%RH)	90 (non condensing)	
Modulation Options		
Analogue	Yes	Yes
Digital	Yes	Yes
DCLM	See DCLM section for options	
Electrical Specifications		
Input Voltage (Vdc)	5.0 ±500mV	3.5 to 5.0
Connector Type	4 Pin Binder M8	
Reverse Polarity Protection	Yes	
NOTES		
* = Wavelength tolerance can vary typically by ±10nm. ** = 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

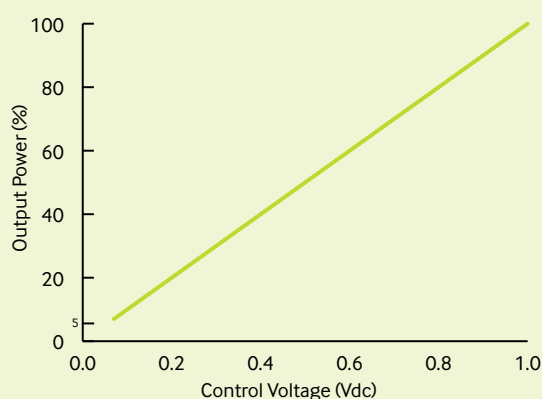
### Intensity Control Function

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: < 0.5 $\mu$ s (Typically)

Fall Time: < 0.5 $\mu$ s (Typically)

GreenLyte-MV-EXCEL

Rise Time: < 10 $\mu$ s (Typically)

Fall Time: < 10 $\mu$ s (Typically)

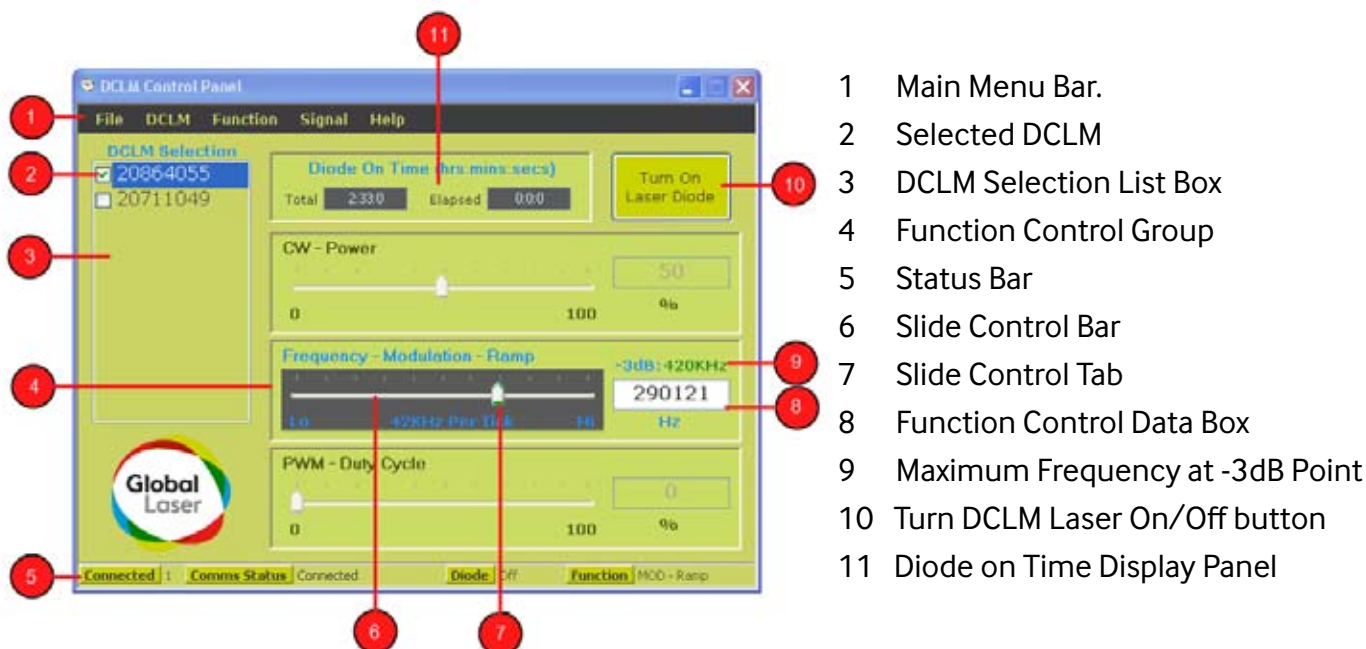
# Lyte-MV DCLM Information

## 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.



## 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) *	Power (mW)			
635	1, 5, 10, 15, 35			
650/660	1, 5 ,10 20, 35, 50			
670	1, 5, 10			
685	20, 50			
785	5, 20, 35, 50, 75, 90			
808	200			
850	5, 30			
905	10			
980	50			
Driver Type	APC			
Power Stability (Over Temperature Range)	±3%			
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 2)	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.

\* = Wavelength tolerance can vary typically by ±10nm. \*\* = At factory set focus. \*\*\* = Varies with laser diode type and output power. Data based on a DCLM Lyte-MV 660nm, 35mW

All Specifications are typical @ 25 °C

# Options & Accessories

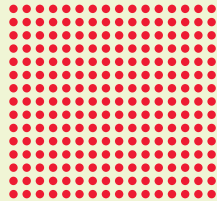
The Lyte-MV laser modules have a wide range of options to suit a variety of applications. These options include projection optics, power supplies, waterproof housing and laser safety glasses.

## 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



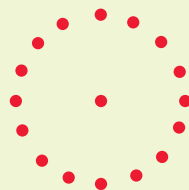
Dot Lines



Viewfinders



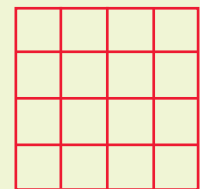
Multiple Lines



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.



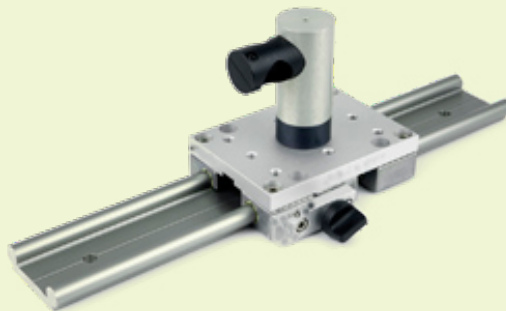
DIA - Protection against Red  
50mW



AL3 - Protection against Green  
50mW

## Mounting Rails

Options range from the simple slide rail system where 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

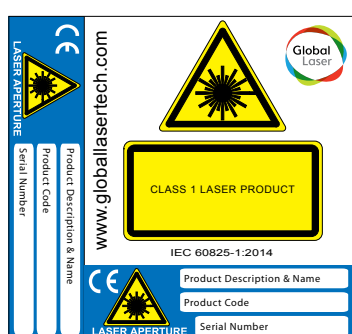
For applications where a laser will be subject to submersion in water, high pressure wash downs or there are high levels of dust, Global Laser waterproof housing provides the ideal solution. Manufactured from stainless steel 316 and certified to IP68 (dust tight and continuous submersion) it is compatible 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.



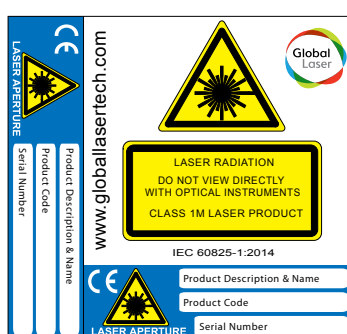
IP68 Waterproof Housing

## Laser Safety

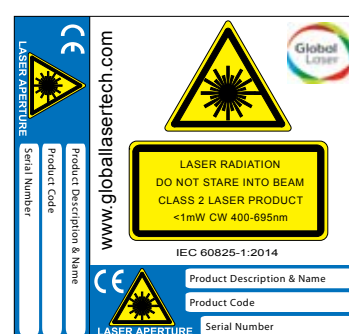
Our lasers are compliant to IEC 60825-1 2014 standards. The lasers fall within one of the following classifications depending on power and wavelength. Examples of the labels are below.



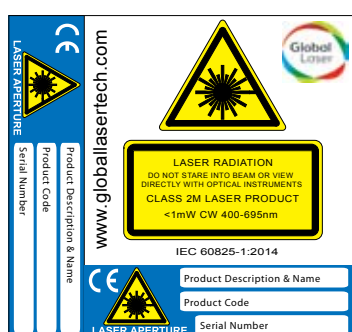
Class 1 Label



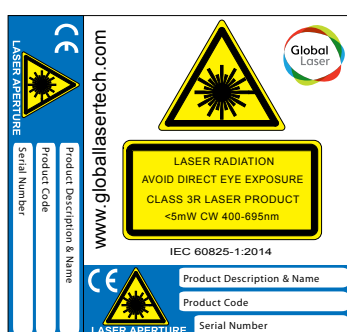
Class 1M Label



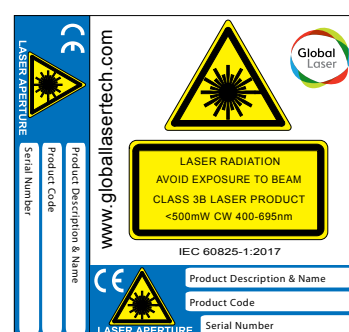
Class 2 Label



Class 2M Label



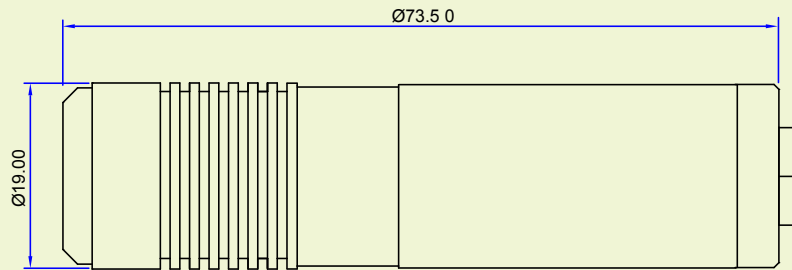
Class 3R Label



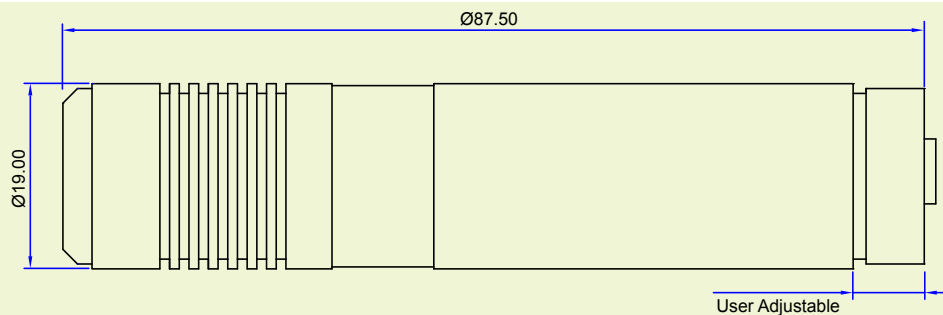
Class 3B Label

# Mechanical Dimensions

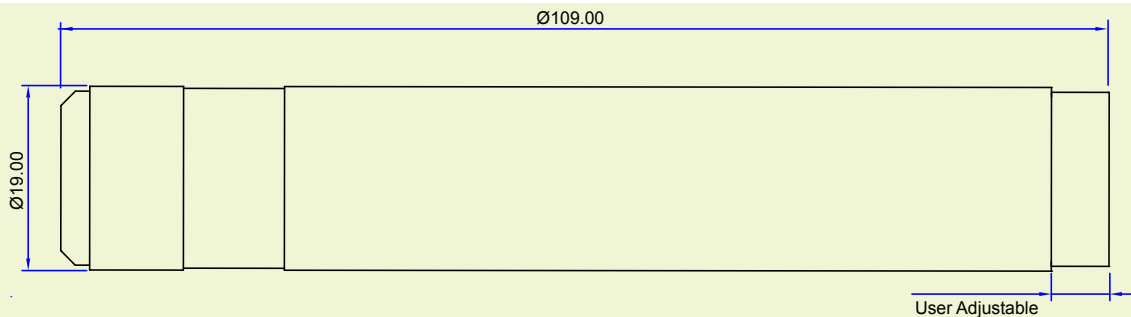
## Lyte-MV



## Lyte-MV-EXCEL



## GreenLyte-MV-EXCEL



Drawings are not to scale

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 rights to change descriptions and specifications without notice.



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