Lyte-MV-EXCEL Analogue Userguide
Red & IR Versions

Product Overview

Thanks for purchasing the Lyte-MV-EXCEL, a laser diode module emitting 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-EXCEL 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.

You can adjust the focus of the Lyte-MV-EXCEL without removing line optics by simply rotating the rear end of the module. This feature, unavailable in a standard Lyte-MV, can save you time and allow you to maintain the laser power classification during the focusing process.

An analogue (LC) circuit allows you to linearly control the continuous output power by applying 0 to 1 V. You can also externally modulate the laser using an arbitrary signal with a frequency up to 500 kHz and amplitude between 0 to 1 V (within the limits of the diode's maximum rise and fall time).

If you have any problems or require help when using a Lyte-MV-EXCEL module then please contact us through sales@globallasertech.com or call your local representative.

Product Operation

A. CW Mode

To operate the laser in CW mode the Red, Black and Blue Leads should be connected in the following way:

Pin	Lead	Lyte-MV-EXCEL Red & IR Versions
1	**Red**	+5 Vdc ±500mV
2	**Black**	0 Vdc
3	**Yellow**	Not Connected
4	**Blue**	V Supply if not using as enable switch

If you have purchased a Lyte-MV with a 5V PS-1 power supply, please follow the below instructions:

1. Connect the Lyte-MV to the PS-1 using the supplied cable.
2. Connect the IEC plug to PS-1 power adapter.
3. Insert the IEC plug into a mains socket.
4. Switch on the power supply at the mains socket or via an optional key switch requested at point of order.

B. Linear Modulation Function

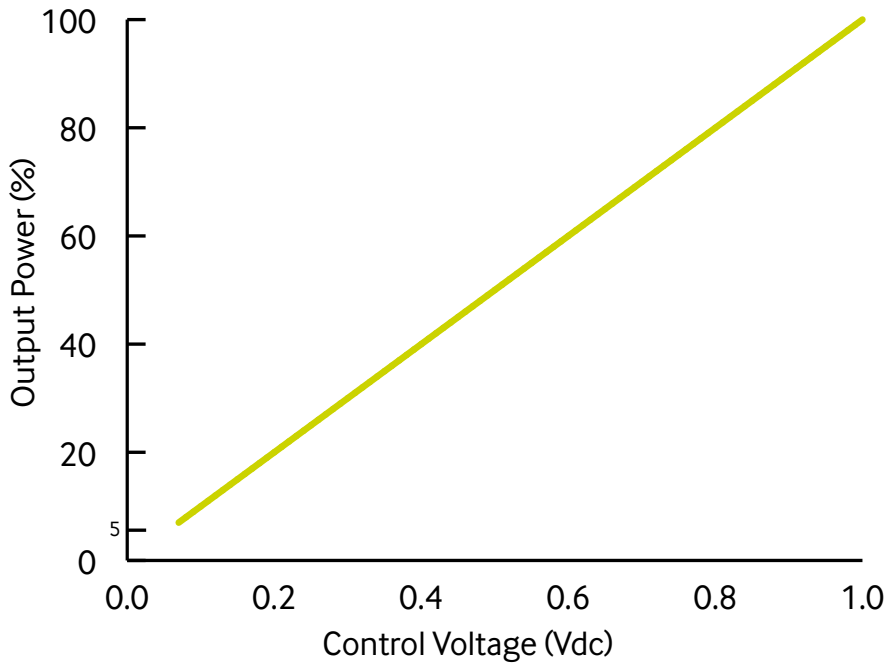
To linearly modulate the laser using an arbitrary signal of up to 500kHz and an amplitude between 0 - 1 Vdc, please connect the leads as below:

Pin	Lead	Lyte-MV-EXCEL Red & IR Versions
1	**Red**	+5 Vdc ±500mV
2	**Black**	0 Vdc
3	**Yellow**	Input Modulation Signal 0 to +1 Vdc
4	**Blue**	V Supply if not using as enable switch

C. Linear Intensity Control

To linearly control the output power, connect the leads as in the below table. Apply 0V to the yellow lead to turn the laser off and 1V to generate maximum power. Please see the linear intensity graph for further details.

Pin	Lead	Lyte-MV-EXCEL Red & IR Versions
1	**Red**	+5 Vdc ±500mV
2	**Black**	0 Vdc
3	**Yellow**	Input Control Voltage 0 to +1 Vdc
4	**Blue**	V Supply if not using as enable switch



D. Setting the Output Power Via a Resistor

The control wire has a 10k Ohm input impedance connected to an internal 1V source which is used as the reference for the factory set power. Measuring the voltage between the Yellow and Black wires with a high (>10M Ohm) impedance voltmeter, will give a reading of 1 V ± 2%. Connecting a 10k Ohm resistance between the Yellow and Black wires will result in the reading falling to 0.5V and the light output falling to half the factory set power. Other outputs between 0 and the factory set power can be achieved with a single resistor Rx by using the formula:

Where Po is the required power output
as Pfs is the factory set power

$$RX = \frac{Po^* 10K}{PFs - Po}$$

Mounting

The lifetime and stability of your laser can be optimised when mounted on a suitable heat sink. This allows the case temperature to be kept within its specified range. Failure to properly heat sink your laser device could result in shortened lifetime or failure of the diode. As a general guideline, the lifetime of a laser diode decreases by a factor of two (approx.) for every 10°C increase in operating temperature.

There are two mounting clamps available for the Lyte-MV-EXCEL: 19mm heavy duty clamp (with/ without magnetic base) and pillow block bearing mount.

A. Mounting the Lyte-MV-EXCEL in the Heavy Duty Mounting Clamp (See Drawing B)

1. Secure the clamp to a surface. There are two methods:
a. Screw an M5 stud to the bottom of the base, or
b. Remove the base by removing 2 x grub screw B with the supplied Allen key, then thread an M5 cap screw through the top of the base. Then re-attach the base to the body of the clamp
2. Loosen Allen screw A with the supplied Allen key
3. Slide your laser into the mounting hole and then tighten Allen screw A
4. Loosen grub screw A
5. Adjust the vertical angle of your laser and then tighten grub screw A
6. Loosen 2 x grub screw B. This will allow the main body of the mount to be rotated independently of the base
7. Adjust the horizontal angle of your laser and then tighten 2 x grub screw B

B. Mounting the Lyte-MV-EXCEL in the Heavy Duty Mounting Clamp with Magnetic Base (See Drawings B&C)

1. Secure the magnetic base to the Heavy Duty Clamp
a. Screw the stud on the top of the magnetic base into the centre hole at the bottom of the Heavy Duty Clamp
2. Remove the keeper from the magnetic base and place on a ferrous surface
3. Loosen Allen screw A with the supplied Allen key
4. Slide your laser into the mounting hole and then tighten Allen screw A
5. Loosen grub screw A
6. Adjust the vertical angle of your laser and then tighten grub screw A
7. Loosen 2 x grub screw B. This will allow the main body of the mount to be rotated independently of the base
8. Adjust the horizontal angle of your laser and then tighten 2 x grub screw B

C. Mounting the Lyte-MV-EXCEL in the Pillow Block Bearing Mount (See Drawing D)

1. Secure the mount to your workbench or surface using the 20 x 11 mm oval slots in the base
2. Unscrew the M6 or M8 socket head screws to remove the clamp from the base
3. Separate the black mounting cylinder from the spherical rolling element
4. Insert your laser into the mounting cylinder

5. Replace both halves of the spherical rolling element around the cylinder and hold in place
6. Position the spherical rolling element and mounting cylinder in the curved section of the clamp and hold in place
7. Replace the other half of the clamp and hold in place
8. Screw the M6 or M8 socket head screws through the clamp and into the base
9. Manually adjust the direction of your laser

Cleaning The Optics

Please place the protective cap over the aperture when the laser is not in use to reduce optical contamination. Optional waterproof housing for the Lyte-MV is also available from Global Laser for applications in the vicinity of cutting fluids, moisture, and high levels of dust.

If the laser pattern becomes fuzzy or unclear, please check the following:

1. Remove LGO/DOE
a. LGOs can be cleaned with an optical cloth, lens cleaning kit, or sterile dry air/nitrogen.
b. DOEs should only be cleaned with sterile dry air or nitrogen. The use of any other cleaning methods will damage the grating.
2. Check the laser is in focus.
3. The collimating lens inside the laser barrel can be cleaned with dry air.

Focus Adjustment

The laser will have been focused and tested at the working distance requested at the time of order. If you did not specify a distance it will be focused at 300mm (11.81 inches). One of the unique features of the Lyte-MV-EXCEL laser is that the focus can be adjusted via the focus control at the rear of the laser. This negates the need to remove any optics as in a conventional laser, which can expose the user to a high power beam of laser light. The focus control should be locked into position via the grub screw. Care should be taken not to completely unscrew the focus control from the rear of the laser module. This will cause the internal optics to become misaligned and result in poor uniformity along the line and/or increased bore sighting error.

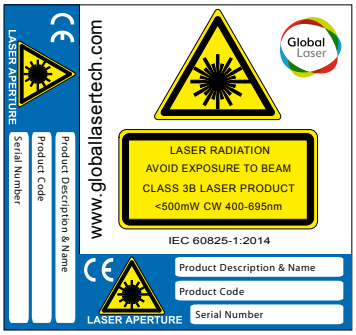
Should you need to adjust the focus (alter the line thickness) please follow the simple instructions below:

1. Ensure that the focus lock grub screw is not tightened (see diagram A). The focus is locked when the grub screw is flush with the focusing control.
2. Turn the focusing control at the back of the laser (see diagram A) clockwise / anti clockwise until the desired focus is achieved. As a rule of thumb if you wish the focus to be at a shorter distance from the laser than it is currently, turn the focus control anti clock wise. If you wish the focus to be at a greater distance from the laser than it is currently, turn the focus control clockwise.
3. Tighten focus lock grub screw (via the supplied Allen key) to lock focus.

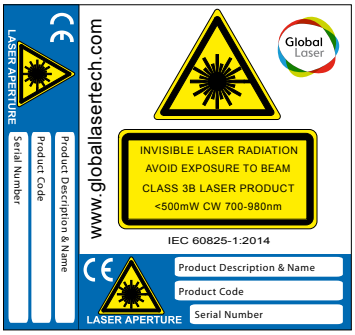
Safety & Classification

These modules are intended for incorporation into customer equipment. They 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 Laser Label



Class 3B Laser Label



Class 3B IR Laser Label

Class 3R Laser Label

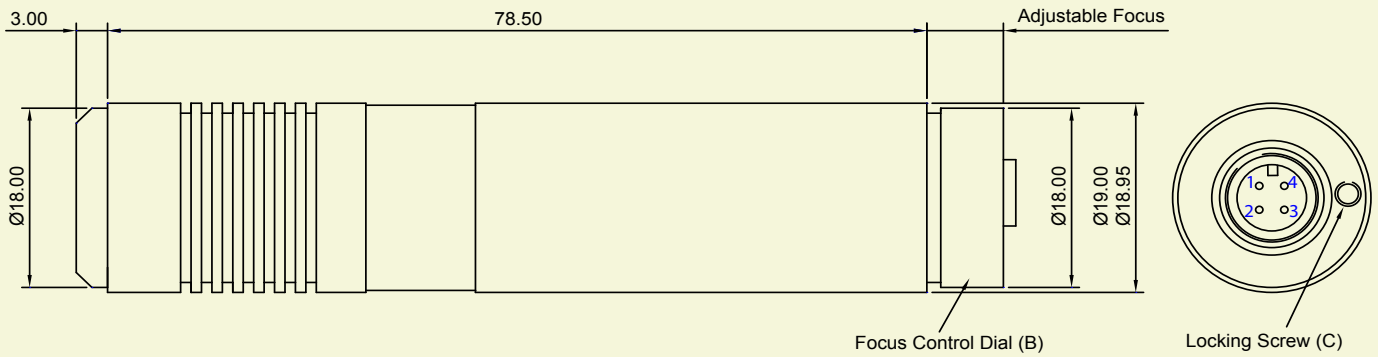
Warranty & Repair

If your product develops a fault within 24 months from the date of purchase Global Laser will repair / replace the product. If you wish to return a faulty product contact your local representative or Global Laser to obtain a RMA (Return Material Authorisation code) and return to the address below:

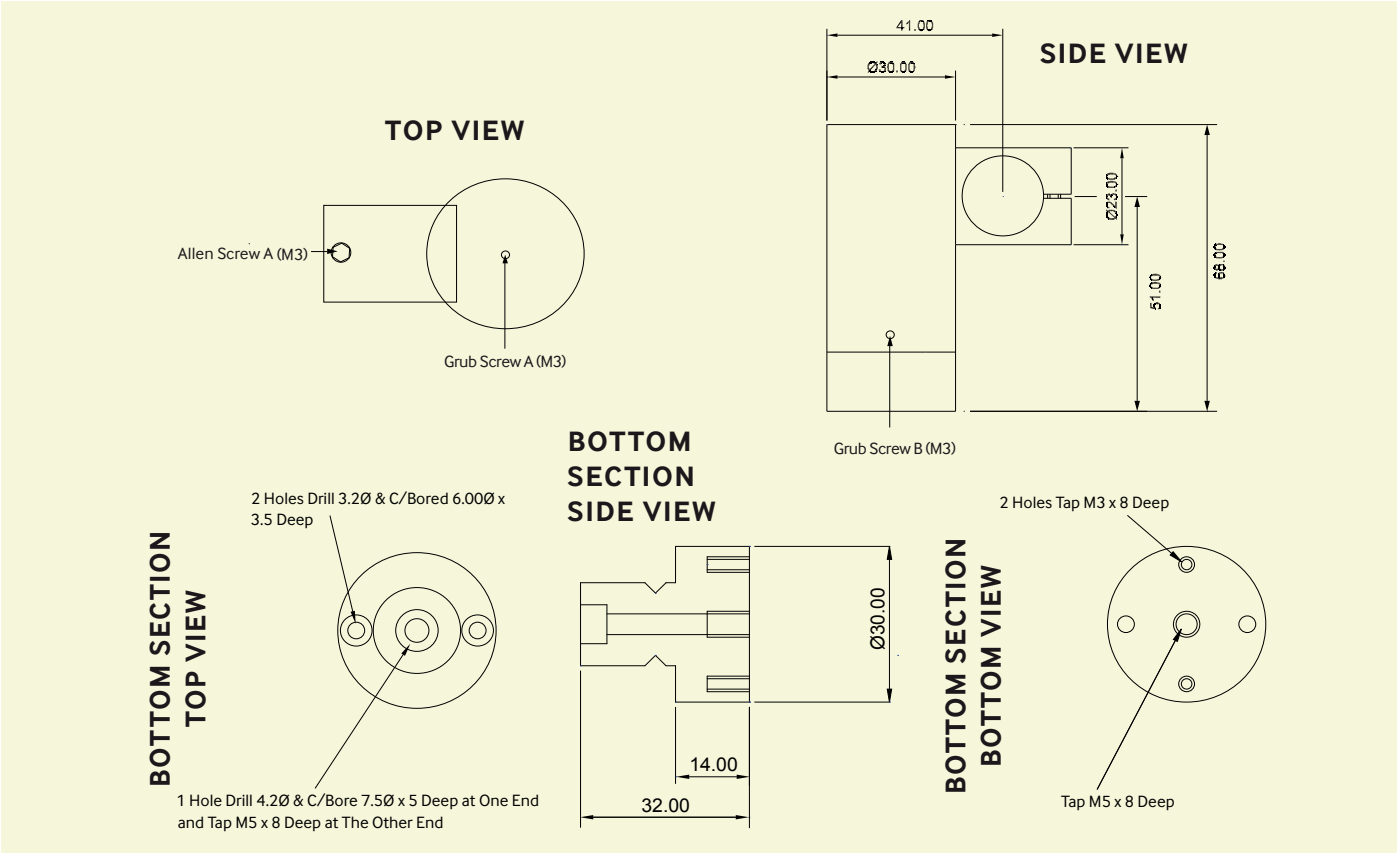
Global Laser Ltd
Units 9-10
Roseheyworth Business Park
Abertillery
Gwent, NP13 1SP
United Kingdom

Diagrams

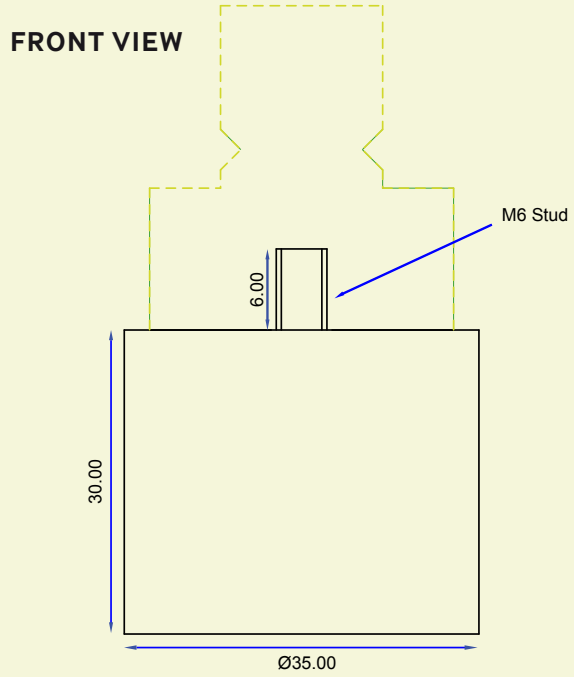
A) Lyte-MV-EXCEL Outline



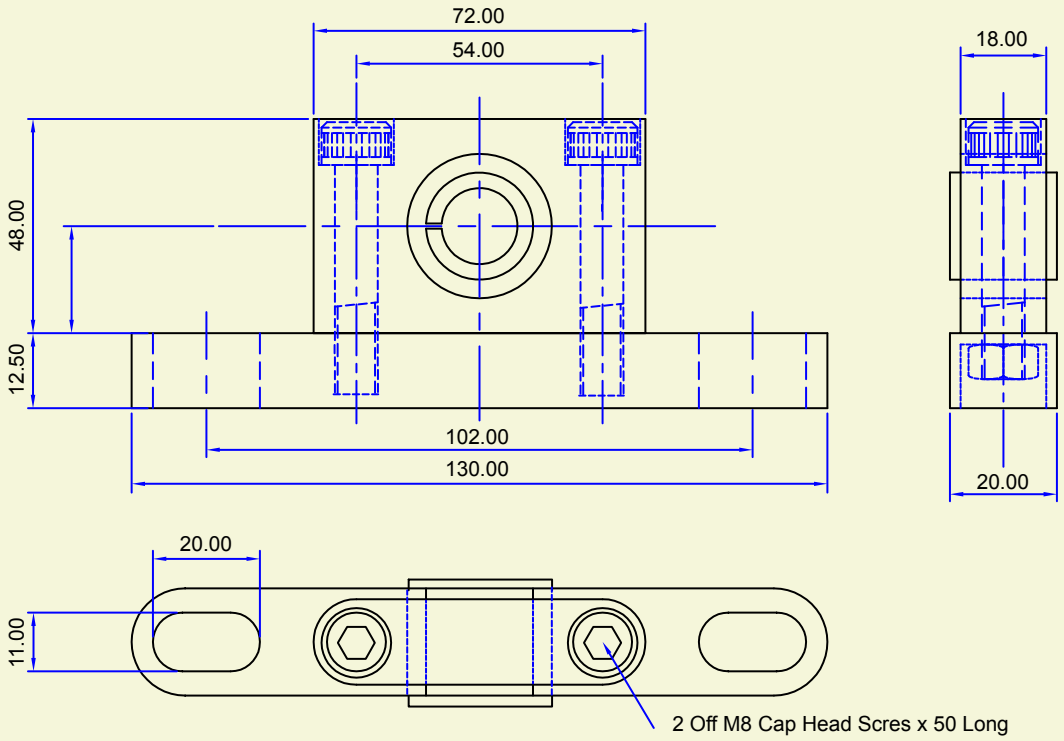
B) Heavy Duty Mounting Clamp



C) Magnetic Base



D) Pillow Block Bearing Mount



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

Drawings not to scale

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