



# GreenLyte-MV-EXCEL Analogue Userguide

## 1. Product Overview

Thank you for purchasing the GreenLyte-MV-EXCEL laser. This emits a 532nm Green Uniform line/projection. If you have any problems or require help when using the GreenLyte-MV-EXCEL please call us on +44 (0)1495 212213 or contact your local representative.

The GreenLyte-MV-EXCEL range of laser diode modules combine a 532nm laser diode, optics and class leading driver electronics to provides up to 50mW of output power without TEC cost and power consumption in a industry standard 19mm housing. The GreenLyte-MV-EXCEL is a reliable industrial laser light sources with well-defined line illuminations which is suitable for a wide range wide range of inspection, measurement and control applications were the advantage of high visibility 532nm is required.

The GreenLyte-MV-EXCEL also features an external focus mechanism that allows the user to adjust the focus by simply rotating the focus control on the rear of the laser without the need for focus tools or the need to remove any optics and expose the user to the laser beam. A wide range of optics are also available to produce uniform lines and projections. A key advantage of the GreenLyte-MV-EXCEL is the ability of the user to modulate the output of the laser. The Digital version allows you to use Pulse Width Modulation (PWM) of the output intensity from a TTL level input signal, within the limits of the laser module's maximum rise and fall time. You can therefore control the mean intensity of the laser beam simply by changing the mark to space ratio (Duty cycle) or modulate the laser with coded information, or synchronize with an external measurement device such as a machine vision camera. The GreenLyte-MV-EXCEL operates from a 5V dc supply or can be powered from 110/240V or 12/24V via an adaptor.



# 2. 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:

GreenLyte-MV-EXCEL		
Pin 1	Red Lead	+5 Vdc ( $\pm 10\%$ )
Pin 2	Black Lead	0 Vdc
Pin 3	Yellow Lead	Not Connected
Pin 4	Blue Lead	V Supply if not using as enable switch

## B: Linear Modulation Function

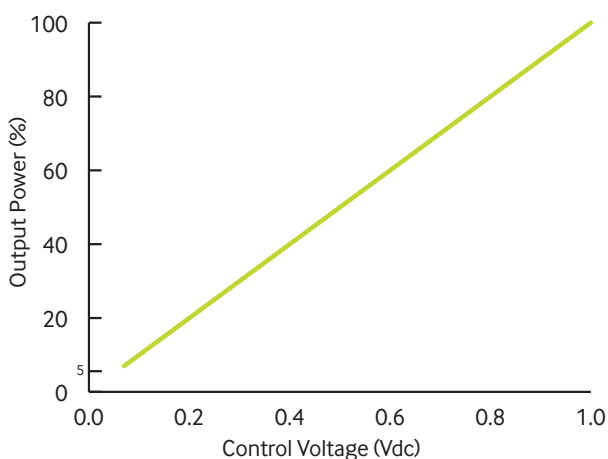
To linearly modulate the laser any modulation signal up to 10kHz with an amplitude of 0V to +1Vdc can be applied to Yellow Lead.

GreenLyte-MV-EXCEL		
Pin 1	Red Lead	+5 Vdc ( $\pm 10\%$ )
Pin 2	Black Lead	0 Vdc
Pin 3	Yellow Lead	Input Modulation Signal 0 to +1 Vdc
Pin 4	Blue Lead	V Supply if not using as enable switch

## C. Linear Intensity Control

Alternatively the Blue Lead can be used for a linear power control function. In this situation, the laser power is determined by a voltage applied to the Yellow Lead, 0V turning the laser off and +1Vdc giving maximum power, with linear trend between (see linear intensity graph).

GreenLyte-MV-EXCEL		
Pin 1	Red Lead	+5 Vdc ( $\pm 10\%$ )
Pin 2	Black Lead	0 Vdc
Pin 3	Yellow Lead	Input Control Voltage 0 to +1 Vdc
Pin 4	Blue Lead	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  $1\text{ V} \pm 2\%$ . 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  $R_x$  by using the formula:

Where  $P_o$  is the required power output  
as  $P_f$  is the factory set power

$$R_x = \frac{P_o * 10K}{P_f - P_o}$$

## Enable Switch (Blue Lead)

An on/off switch function is available via the blue wire. Applying 0V will switch the laser off whilst applying V supply leaves the laser on. This is partially useful for safety interlocks or enable switch's required for laser safety systems. A TTL switch can also be utilised via this lead. TTL High = on and TTL Low = off. Maximum frequency is typically 100 Hz. If not using these function please connect the lead to the V supply or the laser will not switch on.

## E. Operating with a PS-1 5 Volt

If you have purchased a GreenLyte-MV-EXCEL with a 100V/240V to 5Volt PS-1 you will have the following items:

GreenLyte-MV-EXCEL Laser  
GreenLyte-MV-EXCEL to PS-1 Cable  
100V/240V to 5 Volt PS-1  
Main socket to PS-1 Power Lead (UK, Euro or US)

1. Connect the DC Jack on the GreenLyte-MV-EXCEL to PS-1 cable into the DC Socket on the PS-1 power supply and screw binder connector into the connector on the end of laser.
2. Connect IEC plug to PS-1 power adaptor.
3. Plug the main plug into a mains socket.
4. Switch on the power supply via key switch (If you have purchased a 5 Volt PS-1 fitted with a Key switch) or switch on at the mains socket.

## F. Operating with a 11/24 V dc Adaptor

If you have purchased a GreenLyte-MV-EXCEL laser with a 12/24 Volt DC Adaptor you will have the following items:

GreenLyte-MV-EXCEL Laser  
GreenLyte-MV-EXCEL to DC Adaptor Cable  
12/24 Volt DC Adaptor

1. Connect the DC Jack on the GreenLyte-MV-EXCEL to PS-1 cable into the DC Socket on the 12/24 Volt DC Adaptor and screw binder connector into the connector on the end of laser.
2. Connect the flying leads on the power adaptor as follows:

GreenLyte-MV-EXCEL	
Red Lead	+11 Vdc to +32 Vdc
Black Lead	0 Vdc
Yellow Lead	Chassis Earth

- 3: Switch on the DC supply to the 12/24 Volt DC Adaptor.

# 3. Mounting

To ensure the lifetime and the stability of the laser it is recommended that it is mounted in a suitable heat sink/mount. The case temperature should be kept within the specified range at all times, failure to do this could result in shortened lifetime or catastrophic failure. As a guide, laser diode lifetime decreases by a factor of two (approx) for every ten degree increase in operating temperature.

Global Laser's Heavy Duty Clamp has parallel and vertical adjustment which allows the user to aim the laser in any required direction or angle, the robust aluminium construction also assists in conducting heat away from the laser body as well as prevents movement due to shock and vibration. The base plate of the Heavy Duty Clamp has a series of threaded holes to allow secure fastening to stable surface. A magnetic base is also available which simply screws in to the base of the Heavy Duty Clamp and allow it to be fitted to a ferrous surface.

## **4A Mounting the GreenLyte-MV-EXCEL in the Heavy Duty Clamp**

1. Un-tighten Allen screw A (see drawing B) with the supplied Allen key.
2. Slide the laser into the mounting hole (see drawing B) and tighten Allen key A.
3. For vertical adjustment of the laser un-tighten Grub screw A (see drawing C). This will allow the section mounting the laser to be adjusted. When the vertical posting is complete re-tighten Grub screw A.
4. For horizontal adjustment of the laser un-tighten Grub screw B (see drawing B). This will allow the main body of the mount to be moved. When the horizontal positing is complete re-tighten Grub screw B.
5. To secure the Heavy Duty Clamp to a surface machine screw or studs can be used in conjunction with the base section (see drawing C for thread details).

## **4B Mounting the GreenLyte-MV-EXCEL in the Heavy Duty Clamp with the Magnetic Base**

1. Un-tighten Allen screw A (see drawing B) with the supplied Allen key.
2. Slide the laser into the mounting hole (see drawing B) and tighten Allen key A.
3. For vertical adjustment of the laser un-tighten Grub screw A (see drawing B). This will allow the section mounting the laser to be adjusted. When the vertical posting is complete re-tighten Grub screw A.
4. For horizontal adjustment of the laser un-tighten Grub screw B (see drawing B). This will allow the main body of the mount to be moved. When the horizontal positing is complete re-tighten Grub screw B.

# 4. Heatsinking

To ensure the lifetime and the stability of the laser it is recommended that it is mounted in a suitable Heat sink/mount. The case temperature should be kept within the specified range at all times, failure to do this could result in shortened lifetime, catastrophic failure or the internal over current protection circuit to activate.

# 5. Internal Over Temperature and Current Protection

Laser diodes are extremely susceptible to damage from being driven at high temperatures (For green laser diodes this includes the low temperature range). As the temperature varies efficiency decreases, requiring the laser diode to take more current in order to keep the power constant. If this current increases beyond the maximum rating of the laser diode, damage can occur.

Our internal over temperature protection allows the control circuit to keep the power constant across the rated temperature range but clamps the current at a set limit to ensure no damage will be inflicted on the laser diode should the case temperature range be exceeded. In this case the power will decrease in order to keep the current limited, though once the device is brought back within its operating temperature range the power will return to the factory set level, the current will decrease and no harm will have been caused to the device.

# 6. Focus Adjustment

The laser will have been focussed 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 GreenLyte-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 focussing 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 short distance from the laser than it is currently set to 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 set to turn the focus control clockwise.
3. Tighten focus lock grub screw (via the supplied Allen key) to lock focus at designed point if required (see diagram A).

# 7. Cleaning The Optics

It is recommended that when the GreenLyte-MV-EXCEL is not in use the supplied protective cap is placed over the optics to reduce the risk of the being contaminate by dirt. If the GreenLyte-MV-EXCEL is being used in an environment with high level of dust, cutting fluids and other contaminants it is recommended that the GreenLyte-MV-EXCEL be protected by a suitable housing such as Global Lasers “Waterproof Housing”. Please contact Global Laser for more information.

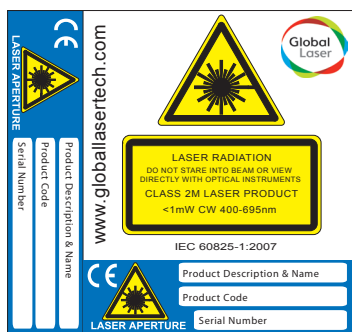
If the laser pattern becomes fuzzy or unclear, please check the following:

1. Check the laser is in focus (see section 6).
2. Verify the optical lens is clean

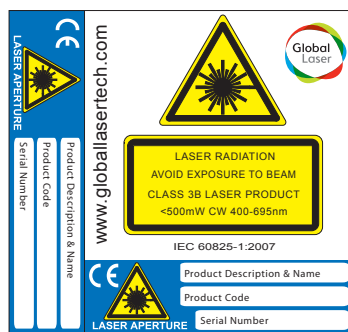
If the lens is contaminated and produces a line projection, the lens can be cleaned with an optical cloth or cleaning kit. If the lens produces any other pattern the module is fitted with a diffractive optics. This should only be cleaned with sterile air or nitrogen. The use of any other cleaning methods will damage the optic.

# 8. Safety & Classification

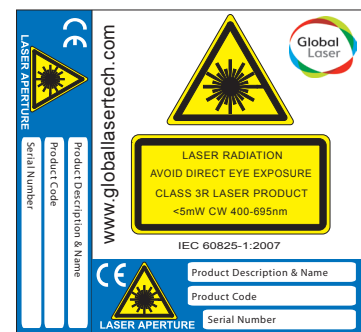
These modules are intended for incorporation into customer equipment. They are classified in accordance with IEC60825-1 2007, which should be consulted prior to designing or using any laser product. The following labels are supplied for attachment to the customer’s equipment, but responsibility for compliance with the standard remains with the user.



Class 2M Laser Label



Class 3B Laser Label



Class 3R Laser Label

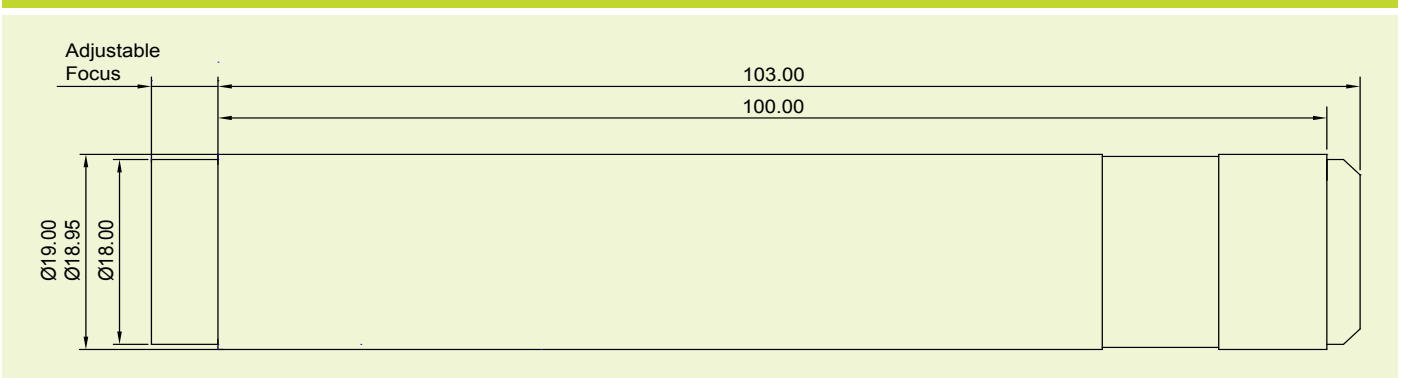
# 9. Warranty & Repair

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:

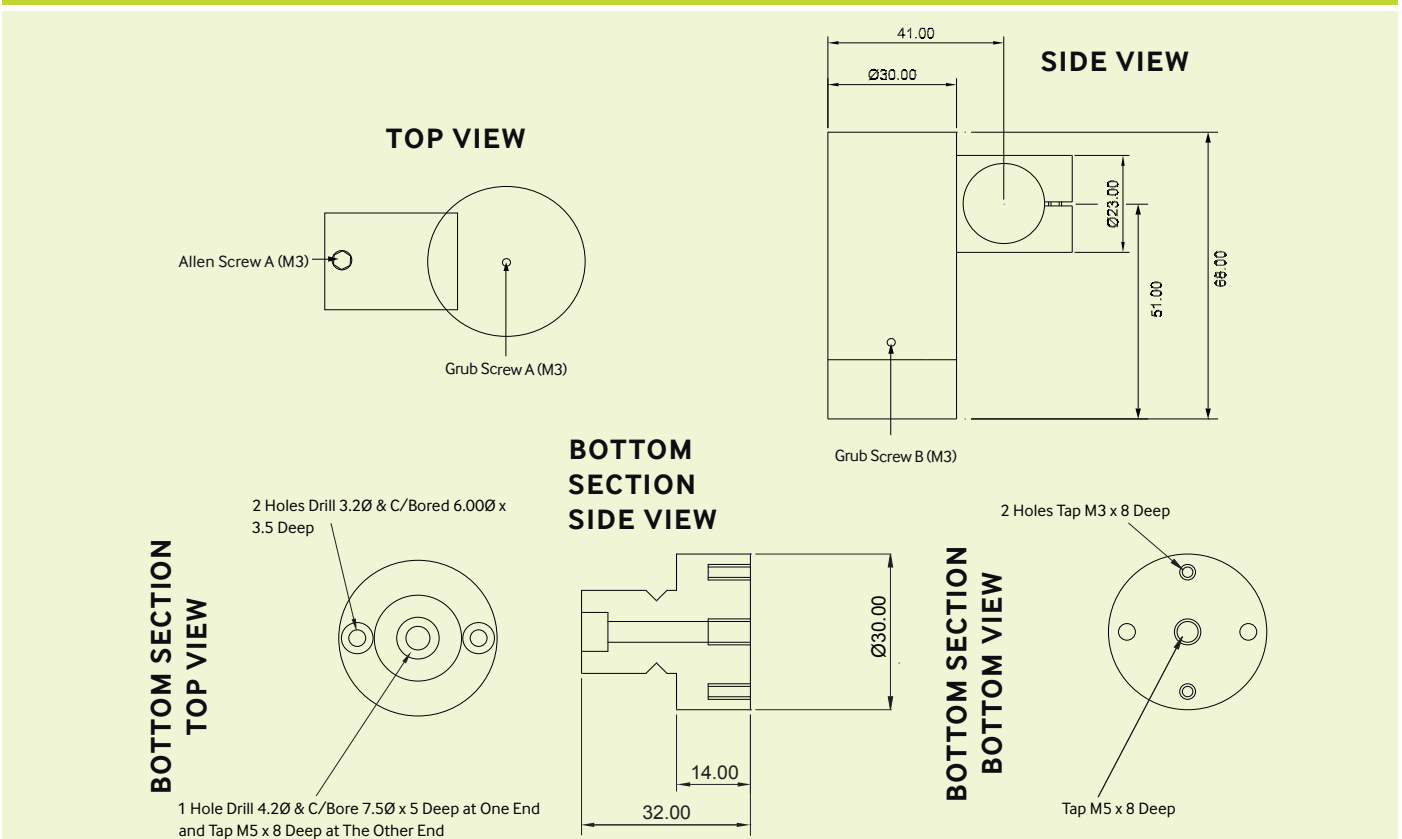
Global Laser Ltd  
Units 9-10  
Roseheyworth Business Park  
Abertillery  
Gwent, NP13 1SP  
United Kingdom

# 10. Diagrams

## A) GreenLyte-MV-EXCEL Outline



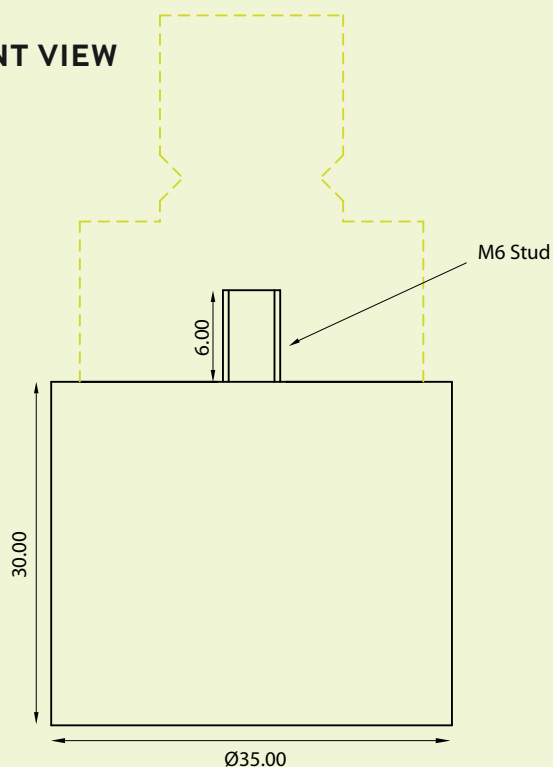
## B) Heavy Duty Mounting Clamp





## C) Magnetic Base

### FRONT VIEW



*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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