



for Professionals

RedBack Lasers DGL1010GM

Electronic Digital Dual Grade - DGL1010GM

Instruction Manual



www.redbacklasers.com.au

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User Safety

- Laser output sign lies near the output aperture.
- Do not stare directly into laser beam.
- Do not disassemble the instrument or attempt to perform any internal servicing. Repairs and service should be performed only authorised service centres of Redback Lasers.
- This instrument complies with the safety Classification standards of laser radiation.



CAUTION: Class 3r laser $< 5\text{mW}$ at 635nm.
Do NOT stare into laser beam or aim at another person.

Follow relevant Australian Standards

DGL1010GM INTRODUCTION

Congratulations on purchasing the DGL1010GM an electronic self levelling dual grade rotating laser level built tough to handle the harshest of job sites.

The DGL1010GM is ideal for building, plumbing and earthmoving, simply set it up on a tripod, turn on, it electronically self levels and the laser starts rotating. Then using the supplied receiver you can set up your levels or grades.

The DGL1010GM has fully automatic dual grade setting capability simply punch in the desired grade either on the keypad or remote and the laser does the rest. The DGL1010GM also features a Grade Tracking Receiver which allows the laser to automatically set the grade to the height of the receiver.

The DGL1010GM also features a smart long range remote control complete with an LCD display duplicating the display on the laser level itself. This make setting grades and the DGL1010GM other features a snap.

The DGL1010GM can also be used on its side for vertical alignment and site square layout and has scan modes essential for indoor visible use.

The DGL1010GM comes with rechargeable Li-ion batteries but can also use Std "D" Size batteries if needed.

DGL1010GM Included Accessories

- DGL1010GM Laser Unit
- Hard Shell Carry Case
- Rechargeable Li-ion Batteries
- Charger
- Laser Receiver LR720T
- Receiver Staff Clamp
- Receiver "L" Mount
- Grade Alignment Scope
- Smart Remote Control
- Side Plate for Squaring
- Axis Adjustment Plate
- Instruction Manual



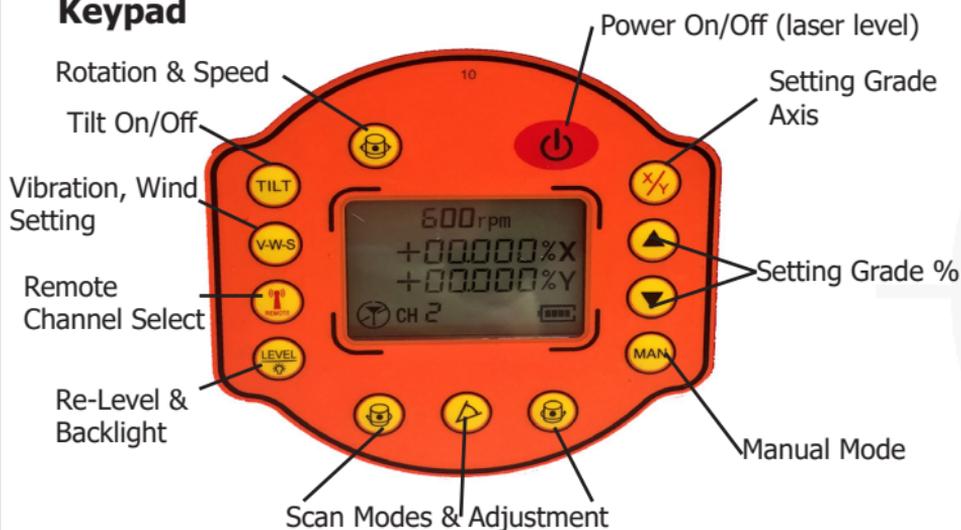
DGL1010GM DIAGRAMS

DGL1010GM Laser Unit



1. Alignment Scope
2. Scope Mount
3. Rotating Head
4. Heavy Rubberised Casing
5. Keypad
6. LCD Display

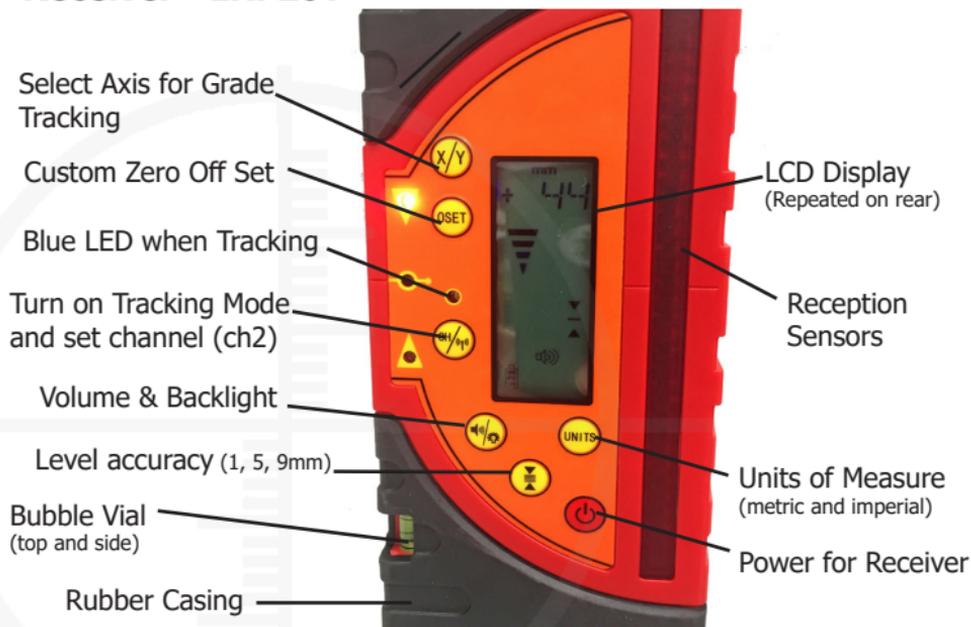
Keypad



Smart Remote Control



Receiver - LR720T



DGL1010GM OPERATING INSTRUCTIONS

Battery Instructions

The DGL1010GM has two battery options either 3 x standard "D" size Alkaline or the Li-ion rechargeable pack. For standard 3 x "D" alkaline operation simply insert into the standard battery caddy in the direction indicated, insert caddy into recess and tighten the locking screw.

To use the rechargeable battery pack first remove standard batteries if inserted and place rechargeable pack into the same battery recess, tightening locking screw.



To charge this battery pack simply inserting the charger plug into the charging socket found on the hinged battery compartment cover. You can also charge the Li-ion pack without it inserted into the laser itself utilising the charging socket on the battery pack. The charger LED is illuminated red during the charging process and will turn green once the batteries are fully charged.

When the power symbol on the laser levels LCD shows low, the rechargeable battery needs recharging or standard batteries need replacing. Note the charger will only charge the supplied rechargeable battery pack. The battery symbol on the remote control LCD indicates the power level of the remotes batteries.

Handy Hints

- *Prior to initial use, charge the rechargeable batteries for at least 8 hours.*
- *Running rechargeable batteries completely flat will increase battery life.*
- *The DGL1010GM can operate off mains by plugging the charger (for indoor use only) into the unit when re-chargeable pack is inserted.*
- *Remember the DGL1010GM can operate using standard batteries when rechargeable pack is out of charge.*
- *The rechargeable pack can be charged either when inserted into the laser or separate to it.*

Turning Laser On

Press Power button  on the laser's keypad to turn on the DGL1010GM. Batteries are low if power bar on the LCD panel is showing low. After turning the laser on, the laser will auto level and rotate. Note that the power button on the remote only operates the remote and not the laser. The DGL1010GM has a massive self levelling range, in other words the body of the laser can be set up on the tripod along way out of level and the electronic mechanism will self level the rotating head to be level. If the body of the laser is set up outside of this self levelling range the laser will emit a continuous beeping sound. Turn off the laser and re-set the body of the laser more level and turn on again.



Tilt Mode

Tilt mode is somewhat similar to tilt on a pinball table in that if when running the DGL1010GM detects significant disturbance or movement that could alter the accuracy of your work the laser will "Tilt" (stop working) and the laser beams and the word "TILT" on the LCD screen will flash.

Tilt mode automatically activates after 30 seconds of laser operation. To turn the tilt feature off use the "tilt" button  on either the keypad or the remote control. The word "TILT" will come up on both LCD screens when activated.

If during operating the laser "tilts" then you will need to re level the laser by pressing the level button  on the remote or keypad, wait a few seconds for it to level and then re-check your work to maintain maximum accuracy.

It is recommended to use tilt mode when optimal accuracy is required or when there is a chance that machinery or worker may interfere inadvertently with the lasers level.

DGL1010GM OPERATING INSTRUCTIONS

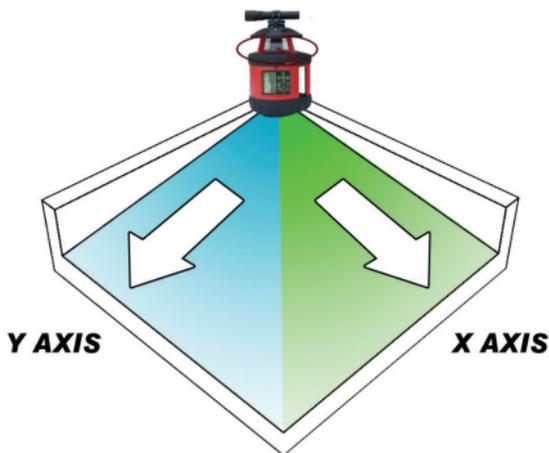
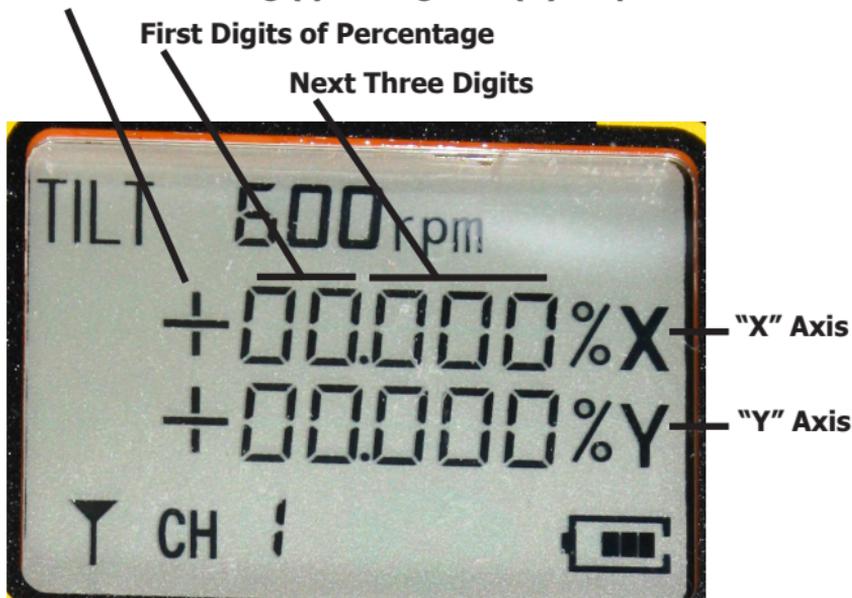
Setting Digital Slope/Grades (refer to diagram page 9)

The DGL1010GM can digital dial in a grade as a percentage to three decimal places. In Slope (Grade) Mode you can set a Grade in either the X or the Y Axis of up to 10.000% see the markings on top of laser for axis alignment. In Slope (Grade) mode the "TILT" and "V-W-S" features can still be used. The DGL1010GM is dual grade, so a grade can be set on the X and Y axis simultaneously. Slope (Grade) can be set from either the laser's keypad or the remote and the grade being selected is shown on both LCD displays. Using the scope and axis adjustment plate aids accurate alignment of axis.

- Turn the laser on, allow to level and begin rotating.
- To select a grade on the "X" axis (see markings on top casing) press and hold 2 seconds the "X/Y" button  on the keypad/Remote. The "X" and "+" will flash on the LCD screens a grade can now be set on the "X" axis.
- To select a negative grade i.e slope up in the direction of the "-X" (on casing) press the down arrow button . To change back to a positive slope press the up arrow button .
- Next press (short press) the "X/Y" button to shift the active digit one place to the right. Use the up arrow  to increase the percentage required and use the down arrow  to reduce it. For example we want to set a 1.666% slope so leave this first digit to "0". (This first digit is only if you want to set the maximum possible percentage grade of 10.000% in that situation you would set the digit to "1")
- Press (short press) the "X/Y" button to shift the active digit another place to the right and use the up and down arrows to select the required number, in this example "1". Then repeat the operation again press "X/Y" button and arrows to select the next three digits to "6" until we get the 01.666% in our example.
- Next long press (2 seconds) the "X/Y" button  this makes the "Y" axis active (flash) and a grade can be set in the same manner the "X" Axis was set or if no second grade is required leave all digits as "0". To seal in these grades and to tell the laser to set them another long press of the "X/Y" button is required or no not enter anything for 8 seconds, The laser will beep and after a few seconds of setting the grades the laser will rotate with the desired grade/grades. The laser will take longer to set larger and dual grades.

NOTE: In grade mode if nothing is entered for 8 seconds, whatever has already been entered will be set and the laser will grade and rotate. If you have not entered all the numbers then re-enter grade mode by pressing the X/Y button and finish entering all the digits you require.

Direction Setting (-) for negative (+) for positive



DGL1010VS OPERATING INSTRUCTIONS

Rotation Speed Setting

The DGL1010GM has 3 rotation speeds; 300rpm, 600rpm and 1100rpm with the default being 600rpm. For most situations this default value will be ideal but when using machine receivers better results may be achieved with a different rotation speed at different distances. Also when used indoors visually different speeds may be clearer to see.  Rotation Speed Button.

LCD Display Light

The DGL1010GM has a backlight feature for the LCD display which is turned on and off with the Level/Light button  a long press will toggle between on and off. The Same button on the remote control will operate the back light on the remote control LCD display.

V-W-S Vibration and Wind Sensor Setting

The DGL1010GM when sensing any movement will temporarily stop the rotation of the laser, re-level and start up again. However, sometimes in high wind or near heavy machinery, vibrations may cause the laser to pause rotation like this so regularly that it slows your work down.

The "V-W-S" button  is a vibration/wind sensor, activating this will desensitise the laser to these vibrations and so allow you to continue to work without it stopping all the time. When you turn on the "V-W-S" the "TILT" function is also activated this ensures that even though you have desensitised the laser it is still protected from major knocks or movement that may affect the accuracy of your levelling/grading job.

Manual Levelling Mode

Manual mode stops the auto levelling mechanism operating so enabling you to set the body of laser at any angle you want and have it rotating. This can be useful for setting large manual grades on dam walls or indoor alignment such as roof lines or balustrades.

"V-W-S" and "TILT" cannot be used in manual mode and any movement or change of angle of the laser will not be indicated to the user.

- To enter manual mode first power up laser then press and hold (2 seconds) Manual button  "MAN" will be displayed on the LCD displays, press again to disable. On remote is the Man/Sleep button.
- Short press the SLEEP button on the remote to put the laser into sleep.

Vertical Rotation Operation (refer to diagram page 4)

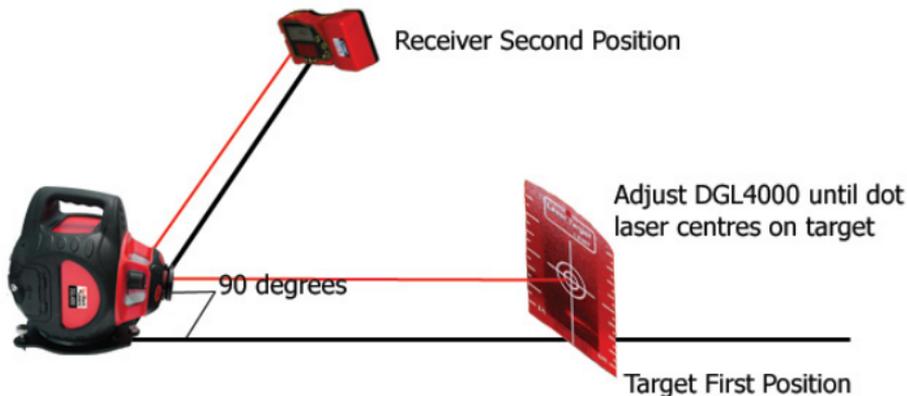
The DGL1010GM can be used on its side for vertical alignment or together with the dot laser out of the front to produce a 90 degree square for site layout. The DGL1010GM can be placed on its side either directly on a tripod or on its included side plate with the datum marker and roughly levelled using the adjustment feet and bubble vial, this brings the laser into self levelling range where the electronics take over. Press On/Off button  to self level.



Note in vertical rotation mode features such as "TILT", "V-W-S" and "Scan" can still be used the same as when in normal horizontal rotation mode.

Once levelled and rotating you can electronically aim the dot laser to a target left to right by pressing and holding the grade/slope arrow button   the longer you hold the faster the dot moves. This is useful for site layout squaring;

- Place datum marker over the datum point marking the conjunction of the 90 degree lines.
- Roughly align laser housing so dot is striking target point along the one line of the 90 degrees, then use the direction buttons to electronically fine tune this alignment.
- Once the dot is on the target use the receiver to pick up the rotating line on the second line of the 90 degree. Your square is now set.



DGL1010GM OPERATING INSTRUCTIONS

Rotation Scan Modes - For Indoor Visibility

The DGL1010GM is also useful for indoor visual levelling and alignment, with Scan Mode you can produce horizontal level lines on walls or when operated on its side, vertical lines.

The Scan Mode stops the laser from rotating and toggles the beam left to right, intensifying the beam making the laser more usable indoors as a visible laser. To activate scan mode press the Scan Mode button . You can set the scan angle to 180°, 45°, 10° and DOT each press of the scan mode button toggles through the different angles. To shift the beam use the left and right Scan Adjustment buttons  . Scan Mode can be operated by both the Control key pad on the laser and also the Remote Control. To return the DGL1010GM back to rotating mode press the Rotation button .

Remote Control Operation (refer to diagram page 5)

The DGL1010GM has a sophisticated radio frequency remote control with full LCD display that provides real time information to and from the laser. Radio frequency means that you have you an exceptional range of up to 50m it also means easier communication even from within the cab of a machine.

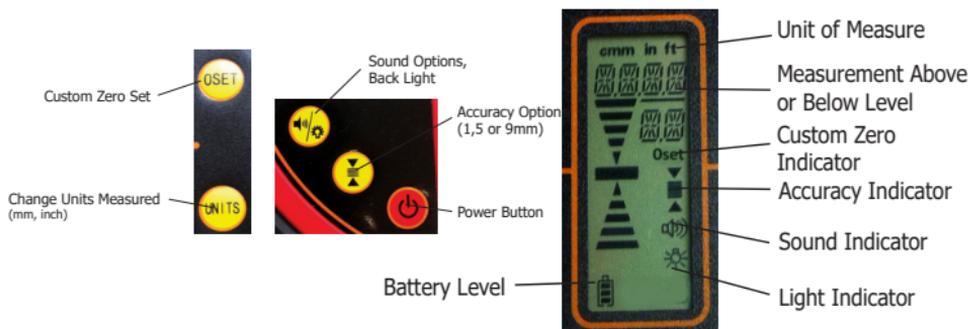
The LCD Display means that all the features of the laser are at you finger tips, you can even instantly see from the display if the laser has "tilted" and press the level button to getting it going again without leaving the cab.

The receiver has multiple channels the default being channel #2 the channel number is displayed on both the LCD on the DGL1010GM and the remote bottom left corner. If you have a second DGL1010GM on site the channel can be changed on the second laser and remote so as not to interfere, this is done by pressing the Remote button  and toggling to the next channel. Note this needs to be set separately on both the laser and remote unit so both show the same channel number, if the laser does not detect a turned on remote on the selected channel the antenna symbol on the bottom left corner of the laser LCD has a line through it.



RECEIVER INSTRUCTIONS

Laser Receiver LR720T (refer to diagram page 5)



- To power up the receiver press the red power button  the display will flash a solid tone will sound. The receiver will now pick up any red rotating laser beam striking the long sensor reception window on the front of the receiver.

The LR720 has a 130mm reception range as indicated by the long red window on the front of the receiver. When displaying the height of the laser compared to the level point in mm the LR720 will display up to +/- 45mm from level, between 45mm and 65mm above or below the LCD display will indicate "OUT" and the appropriate LED lights will flash. When a measurement is displayed it indicates the distance between level and where the laser is actually striking the receiver, the arrows and LED lights indicate which side of level the laser is. This allows you to quickly and accurately to guide the receiver to the level of the laser beam being emitted by your rotating laser level.

- To select sound option press the Sound button (long press) which will cycle through; off, low, high (default) sound levels.
- To select Accuracy press the Accuracy Options button which will cycle through level bands of; 5mm, 9mm and 1mm (default). The default single line between the two arrows on the display indicates fine mode 1mm, 3 lines 5mm and 5 lines is 9mm, the mm value flashes up on the LCD display momentarily.
- Units of measure can be selected with the "units" button millimetres is default, you could also select cm, and inches.
- The "OSET" button is used to set a customised level point other than the default level point as indicated by markings on the casing. A custom level point can be set between 20mm above and 20mm below the default level point. A custom level point is set to where the laser is currently striking (assuming it is within the +/-20mm band) by pressing the "OSET" button the receiver (while laser is striking it) will now show as being level at that height the LCD display will flash "Oset" to indicate a custom level point has been set. To clear this custom level and return to the default setting either press the "OSET" button once more or power off the receiver.

Tracking Grade Match Operation



Axis Indicator for Grade Match feature (note: each press of the X/Y button toggles between X and Y the current Axis will flash up on the screen momentarily)

Receiver Accuracy indicator (note: changes to 5mm when in grade match mode)

Receiver RF Channel Indicator (note: must be same channel as the laser is set to for grade match to work)

Grade match means that the laser will tilt/slope on the selected axis until it reaches the level spot on the receiver, note no more than 10% grade for a grade to be matched.

First you must align either "X" or "Y" axis in the direction you want to grade, using the scope and fine adjustment plate can aid in this. Next turn on the DGL1010GM and let it self level. Then looking at the LCD display on the Laser make a note of the channel selected (this is indicated by a "CH" and a number/letter). For the grade match facility to work both the mm receiver and laser need to be the same. We recommend using Ch2 on the receiver, Laser and Remote.

Take the receiver to the location that you want to grade match and along the axis you have determined, e.g. "X" axis. Set the receiver at your required height facing its front towards the laser level. Power up the receiver, then press the "CH" button on the receiver (2 seconds) the channel indicator will display on the LCD displays on the receiver. To match the channel that is being used on the laser level press the "CH" button.

When the receiver is on the same channel the blue LED on the receiver will start flashing indicating its on the correct channel and communicating.

Make sure that the receiver is set to the same axis that you have aligned to for example "X". Press the X/Y Button on the receiver to toggle between the "X" and "Y" axis.

The DGL1010GM will now slope the laser on the "X" axis first in one direction (+ve) then the other (-ve) until it finds the receiver. Once the laser is striking the receiver, both the receiver and DGL1010GM will display the number of mm away from level and on the laser on the line below will indicate the percentage grade this is. Once the laser has locked onto level the blue LED will turn off indicating that grade has been successfully matched and the laser is now locked into this grade.

You can now use the receiver to find this graded plain anywhere along or parallel to this axis. To cancel this grade simply turn off and on the DGL1010GM.

Tracking Vertical Alignment Operation

The DGL1010GM can utilise the Tracking feature when it is in vertical rotation mode (laser mounted on its side) making it great for Fence alignment (see RedBack's OPTIONAL Fence Alignment Kit Accessory).

The principles for working in vertical rotation mode are the same, the difference now is that the receiver is used on its side and the laser shifts the rotating plain left to right to find the receiver. Note that the receiver must be set to the "X" axis. Once complete this gives a strait alignment line .

The DGL1010GM features a visible dot at 90 degrees to the vertical rotation, this can be used for site squaring. The Receiver has a maximum range of approximately 60m for communicating with the DGL1010GM this may vary depending on the environment and battery quality and charge, for laser reception the receiver will work beyond 300m radius.

DGL1010VS Technical Specifications

Laser Wavelength	635nm <5mW
Laser Class	3r
Range with Receiver	600m Diam Rotating
Horizontal Accuracy	±1mm/20m
Gradient Setting	Single Axis ±10% (max) Dual Axis ±10% (max)
Rotation Speeds	300rpm, 600rpm
Self Levelling Range	±5°
Temperature Range	-20°C - 50°C
IP Dust Water Resistance	IP66
Power	4 x "D" Alkaline or Li-ion pack
Low Power	LCD Display
Size	220x200x280mm
Weight	5Kg

Calibration & Self Check

All Redback Lasers have been checked for calibration and certified by one of our technicians here in Australia prior to despatch and should under normal conditions not go out of calibration. A calibration certified sticker with the date and name of technician is located on the laser itself. It is worth checking calibration from time to time particularly after any known knocks or drops. An easy way to continually check calibration is to always double check you work with the laser located in a different position or use an alternate vertical line. Various other methods for checking calibration can be found at www.redbacklasers.com.au/downloads or the laser can be returned to our service department for checking and re-calibration.

- Keep laser and accessories stored in protective case.
- Make sure laser is stored dry, dry out before storage to prevent damage.
- Remove batteries when not used for an extended period of time to prevent leakage.
- The DGL1010GM is a precision instrument and should not be subjected to excessive knocks, drops or vibrations.
- Self check calibration from time to time.
- For service contact Redback Lasers. www.redbacklasers.com.au

REDBACK LASERS WARRANTY

Duration of warranty is fixed and automatic, when we advertise 5 years on a particular model, its five years. No drop down to a lesser time if you forget to register, registration is NOT required just proof of purchase showing date.

Although the duration of our warranties are for a particular period it does not mean we will charge you for a genuine warranty failure a month or two outside that warranty period, we believe in a fair go.

Even though a product shows signs of accidental damage, scratches and the like, we will not automatically fail the warranty claim, if the fault is NOT caused by a drop or misuse and is a genuine warranty failure then we will cover it.

Calibration is not covered by warranty much the same as the wheel balance on your car is not covered by warranty, we do however offer a one off free re-calibration service during the period of warranty, conditions and details below.

CMI Industries Pty Ltd provides consumers with a warranty to our products, this is in addition to requirements of any relevant legislation such as the Competition and Consumer Act 2010. Definitions:

"CMI", "We" or "Our" refers to CMI Industries Pty Ltd (ABN 29 102 713 922) of Unit 2 / 381-383 Thompson Rd, Bell Park, Victoria 3215 ph 1800 769 858

"You" or "Consumer" refers to the initial purchaser of the product.

"Product" refers to goods manufactured by or for CMI Industries Pty Ltd under the brands of RedBack Lasers, Level1Laser and CMI Lasers.

"Material" refers to material or component used in the construction and manufacture of the product.

"Workmanship" refers to handling, assembly and manufacturing processes done by or for CMI Industries Pty Ltd in order to manufacture the products.

"Warranty Period" For the DGL1010GM is Five Years. Warranty period is from original purchase date, no extension is made in the event of warranty replacement products supplied or time spent being repaired.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

CMI warrants that our products will be free from defects in material and workmanship for the warranty period.

CMI promises to repair or replace, free of charge, the product or part of product if found to be faulty due to defective workmanship or materials within the duration of the warranty as long as the following terms and conditions are met;

- Product must not have been misused or abused, must not have incurred accidental damage or had un-authorized repair or tampering that has caused or contributed to its fault or failure.
- You must contact CMI by phone, mail or email immediately when a fault or defect has become apparent and within the warranty period.
- Product must be returned to store of purchase or directly to CMI, we will cover cost of postage only when sent by our reply paid Australia Post service (Australian Main land and Tasmania only) details will be provided upon phone, post or email communications with us.
- CMI will cover cost of freight back of repaired or replaced product to original purchase store or you directly (depending on how it was sent Australian Main Land and Tasmania only).
- CMI will determine whether to repair or replace the product or part of product on a case by case basis.
- Further exclusions in this warranty include damage or defect caused by use of non-original accessories or parts, damage in transportation, normal wear and tear, damage through moisture, damage due to electric surge, failure due to neglect or damaged caused by adjustments not outlined in CMI's instructions.

Subject to the requirements of all applicable Australian Acts or legislation and to the extent permitted by law, CMI accepts no liability (whether expressed or implied) of any nature whatsoever for any loss of earnings, hiring of replacement equipment, inaccurate work carried out by the consumer or agent, damage or injury arising as a result of any fault in the product. It is the consumers responsibility to maintain good working practices and regularly test their tools for accuracy and serviceability.

Calibration of the product is not covered by warranty subject to the requirement of all applicable Australian Acts or legislation and to the extent permitted by law, CMI does however offer a free re-calibration service (once within the period of the warranty) you are liable for the cost to send the product to us then we will recalibrate and return the product to you free of charge. Note this offer is invalid if the product shows signs of misuse or accidental damage that has caused it to go out of calibration.

A CMI product returned that fails to fall within the terms and conditions of this warranty will be quoted for repair.

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