CXR880 - Hybrid Rotating & Line Laser All in One
Builders & Fit Out Laser

RedBack™ Lasers

CXR880

Instruction Manual

www.redbacklasers.com.au

CONTENTS

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 II laser <1mW at 635nm. Do NOT stare into laser beam or aim at another person.

Follow relevant Australian Standards

CXR880™ INTRODUCTION

Congratulations on purchasing the CXR880™ a unique hybrid laser level featuring both a rotating laser and outdoor line laser technology, this laser truly does do everything a builder needs.

The CXR880™ is ideal for general site levelling, earth moving and landscaping, simply set it up on a tripod, turn on, it electronically self levels and the laser starts rotating. Then using the supplied LRMulti receiver in rotating mode you can set up your levels or grades.

The CXR880™ is also ideal for site layout or squaring with the 4 outdoor lines all at 90° simply align over your datum and using your included LRMulti Receiver in line mode you can quickly and accurately set up your site.

The CXR880™ is also ideal for all types of internal fit out such as windows, plaster, electrical and much, much more, using either the vertical lines or the horizontal rotating beam in scan mode visibly.

Other features of the CXR880™ include dual grade setting, plumb up and down, rechargeable Ni-Mh and Std "C" Size battery operation and Two Year Redback Warranty. (See page 16)

CXR880™ Included Accessories

- CXR880™ Laser Unit
- Protective Carry Case
- Rechargeable Ni-Mh Batteries
- Charger
- Laser Receiver LRMULTI
- Receiver Staff Clamp
- Remote Control
- Magnetised Target
- Tripod Base
- Glasses to Assist Viewing of Laser
- Instruction Manual

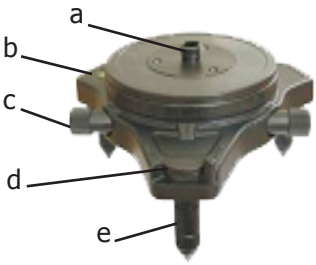
CXR880™ Laser Unit

RedBack™ Lasers

CXR880

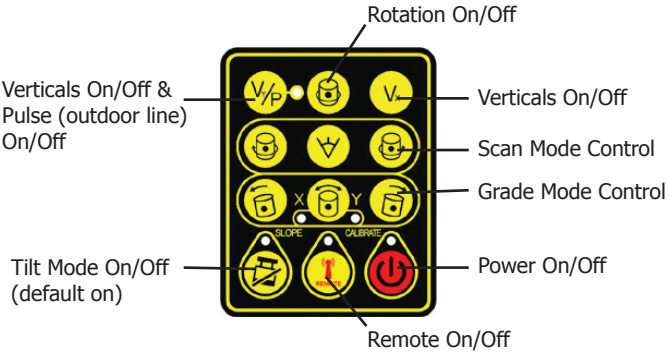
1. Laser Output Window
2. Remote Sensor
3. Charging Socket and LED
4. Keypad (page5)
5. Plumb Down Output
6. 5/8" – 11tpi Screw Thread
7. Battery Compartment

Tripod Base

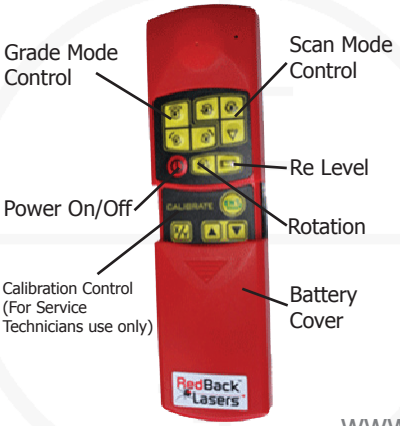


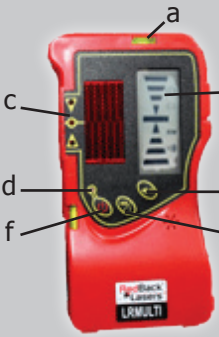
a. 5/8" – 11tpi Screw Thread
b. Bubble Vial
c. Fine Rotation Knob
d. Rotation Lock
e. Adjustable Feet

Keypad



Remote Control & Receiver





a. Bubble Vial
b. LCD Levelling Display
c. LED Levelling Display
d. Line/Rotate Mode Light
e. Speaker On/Off
f. Power & Line/Rotate Mode
g. Line Range/Rotate Coarse

Battery & Charging Instructions

The CXR880 has two battery options either 4 x standard "C" size Alkaline or the Ni-Mh rechargeable packs.

For standard 4 x "C" alkaline operation simply insert batteries into the battery compartment in the direction indicated and replace the battery compartment cover. Note a good quality Alkaline battery is recommended anything less will provide only limited running time.

To use the rechargeable batteries insert green battery packs into the same battery compartment and connect the battery wire plugs onto the sockets (they will only go on one way). Replace the battery cover and tighten the screw.

To charge these batteries, simply insert the charger plug into the charging socket. The LED is illuminated red during the charging process and will turn green once the batteries are fully charged.

When the power LED on the keypad flashes, the battery needs recharging. It is recommended to run the battery until the power LED is flashing this helps to extend the life of the battery. Note the charger will only charge the supplied rechargeable battery packs.

Handy Hints

- *Prior to initial use, charge the rechargeable batteries for at least 8 hours. (batteries are not charged when shipped)*
- *Running rechargeable batteries completely flat will increase battery life.*
- *The CXR880™ can operate off mains by plugging the charger (for indoor use only) into the unit.*
- *Remember the CXR880™ can operate using standard batteries when rechargeable ones are out of charge.*

Turning Laser On

Press Power button on the keypad to turn on the CXR880™, power LED will light. Batteries are low if power LED flashes. After turning the laser on, the laser will auto level and start to rotate. The power button on the remote will not operate until the laser has been powered up from the keypad direct, the power button on the remote then acts as a standby button. The CXR880™ has a large self levelling range, however, if the laser happens to be set up outside this range a warning will sound and lasers flash. Re-set the laser more level using bubble vial and adjustment feet on tripod mount if fitted or level on survey style tripod.

Tilt Mode

Tilt mode is somewhat similar to tilt on a pinball table in that if when running the CXR880 detects significant disturbance or movement that could effect the accuracy of your work the laser will "Tilt" (stop working) and the laser beams will flash to indicate this. You will need to then re level the laser by either pressing the level button on the remote or pressing the tilt button twice on the keypad, wait a few seconds to level and then re-check your work to maintain maximum accuracy.

Tilt mode is defaulted to being **ON** and will automatically activate 30 seconds after the laser has been powered up and the LED above the Tilt button will light to indicate it has been activated.

To deactivate the tilt mode press the tilt button the LED above it goes out. It is recommended to use the laser with tilt mode set on when using the rotating laser outdoors and turned off the tilt mode for indoor or line use, this will allow time for aligning the lines without tilt mode kicking in and forcing you to re-level. Tilt de-activates in Slope(grade)/Manual operation.

Rotation Speed Settings & Turning off Rotation

- In rotating mode, a short press of the Rotating Speed Button will switch the rotating speed between 500rpm (default) and 200rpm.
- An extended press of this button (approximately one second), will stop the laser rotating and the rotating laser will turn off.

Rotation Scan Modes - For Indoor Visibility

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. You can set the scan angle to 60°, 30°, 5° and 0° and shift the beam both left and right. The Scan Mode can be operated by both the Control Panel on the laser and also the Remote Control.

- Press the Scan button to enter scan mode on rotating laser.
- Press Scan button again to set angle. The first press, area scan 60 °, second press 30°, third press 5°, fourth press 0°, fifth press 60° etc….
- Rotate the scan line left or right by pressing Scan Shift buttons as indicated by direction arrow on button.
- Press and hold Scan Shift button to rotate the scan line quickly.
- To return to rotation mode press the Rotate button .

Scan Line mode, line being moved using remote control

Vertical Line Operation (refer to diagram page 5)

The vertical lines on the CXR880 can be used both indoors visibly and outdoors in pulse mode with the included LRMULTI receiver set in line mode (see receiver instructions on page 12). Lines can used either in conjunction with the rotating beam or on their own. Note: all controls for the Line modes are located on the laser's keypad only.

- Once the laser has been powered up and auto levelled turn on the first two vertical lines press the V_Y/P button (short press). Press V_X button for the other two vertical lines. Pressing again will turn each set of lines off.
- To use the lines outdoors with the LRMULTI receiver the lines need to be set into pulse mode, this is done by pressing and holding the V_Y/P button 1 second the LED next to this button will light. Note: the receiver need to be set into Line Mode see page 12.
- Lines can be used in Manual levelling mode simply by pressing the Slope/Grade button , now the laser can be set at any desired angle either using the Slope Grade Direction buttons or manually tilting the laser housing to the desired angle.

Laser receiver LRMULTI is used to pick up the lines as all line lasers are difficult to visually see when used outdoors. Picture shows a graphical representation of laser lines

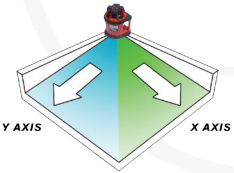
Setting Slope/Grades - Rotating Laser (refer to diagram page 5)

The CXR880™ can be used to set grades. In Slope (Grade) Mode you can set a Grade in either the X and or the Y Axis of up to 8% see the markings on top of laser for axis alignment. When the laser is in this mode it is no longer continually self levelling and so the Tilt function does not operate and any disturbance to the laser will not be indicated to the user. Ideally locate the laser away from other workers and machinery to avoid any accidental disturbance to the laser.

- Turn the laser on, allow to level and begin rotating.
- On either the control panel of the laser or on the remote control press the Slope (Grade) Mode button 

. The Slope and the X LED will illuminate.
- Select the axis you wish to grade by again pressing this same button and the selected X or Y axis LED will light.
- Move the laser plane on the selected axis up or down using the Slope Grade Direction buttons 
.
- To reset and re-level press and hold the Slope Grade button 

.



The CXR880™ can be used to set grades on both the "X" and "Y" axis simultaneously

Setting a Grade

Following is a method of setting a grade using the slope grade buttons as previously discussed. Here we will run through setting a single grade on the X axis, for a dual grade simple repeat the process on the Y axis.

Set up the laser aligning the X axis with the direction of the required grade rise/fall, the laser can be placed anywhere on site as long as the X axis runs parallel with the desired grade.

For this example we want a grade of 1 in 60 or 1.667% or in other words for every 6m (6000mm) travelled away from the laser along the X axis we want the laser plain to tilt down/up 0.1m (100mm).

To achieve this measure out 6m away from the laser along the X axis and hold the staff at this point slide the receiver up/down the staff until the receiver indicates level (see receiver instructions page 12).

Then making a note of the height on the staff slide the receiver up/down the staff 100mm, this is now the height the laser needs to be hitting to be setting a 1 in 60 slope or grade.

Using the remote, select grade mode on the X axis and use the Slope Grade Direction buttons to slope the laser until the receiver shows level.

The Grade is now set at 1 in 60 or 1.667% on the X axis and anywhere parallel to the X axis on site.

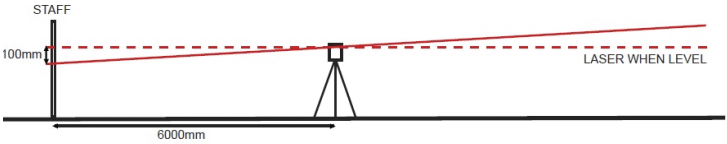


Chart below gives a range of grades and the distance the receiver shifts all based a 5m distance of staff away from laser.

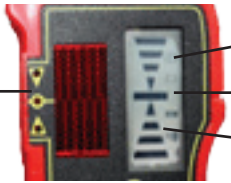
GRADIENT	%	DISTANCE LASER (M)	MOVE RECEIVER (MM)
1 IN 20	5	5	250
1 IN 30	3.3	5	167
1 IN 40	2.5	5	125
1 IN 60	1.66	5	83
1 IN 80	1.25	5	63
1 IN 100	1	5	50

Laser Receiver LRMULTI (refer to diagram page 5)

The Multi Function Receiver detects both pulsed laser lines and rotating lasers although not at the same time. The LRMULTI can be switched between rotating and line modes with the Power button on the receiver.

- A short press of the Power button on the receiver will turn on and off the receiver.
- A long (1 second press) of the same button once turned on will toggle between rotating and line laser modes. **A GREEN illuminated power LED indicates Rotation mode and a RED LED is Line mode. Note: lines will only be picked up if the laser lines have also been put into pulse mode see page 9.**
- Pressing the Speaker button toggles speaker on and off.
- Pressing the Coarse/Fine Mode button has a different affect depending if the receiver is set to Line or Rotation.
    - In Rotation Mode this button toggles between coarse and fine mode, in fine mode indicated by | the accuracy of level is at its highest with only small movements up or down by the receiver taking it off level. In coarse mode ▶◀ there is more movement up and down allowed before showing off level this is more suitable for general site levelling.
    - In Line Mode this same button toggles between Short and Long Range reception. Short range indicated by ▶◀ gives accurate reception of pulsed line laser up to approx 10m and Long Range indicated by | will receive between 10m to 60m from laser.

The LRMULTI has 3 LED light displays which indicate laser is above, below and on level and a large LCD display which has a progressive display indicating when the laser gets closer to the level mark. If the receiver is left turned on without a laser being received it will auto power down after 10 minutes.



Tripod Base (refer to diagram page 4)

The CXR880™ can be operated with or without the Tripod base. The base is ideal for outdoor squaring/layout as the Fine Adjustment Rotation knob (c) is handy for aligning the vertical beams, also indoors it is particularly useful when using the laser for plumb alignment. The Adjustable Feet (e) can be used to bring the laser into self levelling range with the aid of the Bubble Vial (b) when the laser with base is placed on the ground. To remove the base place the Lock Switch (d) in the locked position and rotate the base off anti-clockwise.

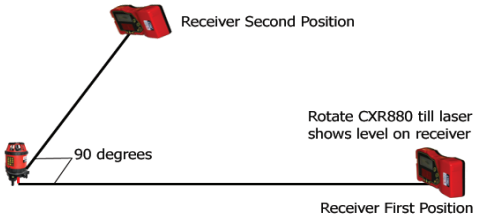
Setting a Site Square and layout

The CXR880™ has 4 vertical line all at 90 degrees to each other, this makes this laser ideal for setting Site Squares and general outdoor and indoor layout without the need to do a 3-4-5 calculation.

First place the CXR880™ over the datum corner for the desired 90 degree square using the plumb down reference point. Next align one of the vertical lines with one of the lengths by placing the receiver on it side at the far end of the line to the datum point. (remember turn on in line mode and select relevant range sensitivity see page 12)

Turn on all vertical lines, turn tilt off and select pulse mode (outdoor mode), rotate the body of the laser at first manually then with the fine rotation knob until the receiver picks up the laser and the solid tone indicating level is heard. (sometimes its hard to get the laser beam exactly on the level solid tone due to the extreme accuracy of the receiver if you get within a millimetre or so that will be accurate enough for most jobs)

Take the receiver over to 90 degree line move the receiver side to side slowly until you pick up the line and again get the solid tone. The point from the receiver to the datum point is the second length of the square and is at 90 degrees to the first, your site square is done.



Technical Specifications

Laser Wavelength	635nm <1mW
Laser Class	II
Range with Receiver	500m Diam Rotating 60m Radius Line (Pulse)
Horizontal Accuracy	±2mm/20m
Vertical Line Accuracy	±2mm/10m
Plumb Down point Accuracy	±4mm/10m
Vertical Line Angle Accuracy	±3mm/10m
Rotation Speeds	200rpm, 500rpm
Self Levelling Range	±5°
Temperature Range	-10°C - 45°C
Scan Angles	60°, 30°, 5°, 0°
IP Dust Water Resistance	IP55
Power	4 x "C" Alkaline or Ni-Mh pack
Low Power	Power LED Flash
Size	142x170x194mm
Weight	2.5Kg

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. We at Redback Lasers provide a once off free calibration and check within the duration of the warranty period see back cover for details.

Care & Maintenance

- 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 CXR880™ is a precision instrument and should not be subjected to excessive knocks, drops or vibrations.
- Self check calibration from time to time. see page 11
- For service contact Redback Lasers. **www.redbacklasers.com.au**

Trouble Shooting - FAQ

Q. ***I cannot get the receiver to pick up the vertical lines!***
A. *Check the lines are set into Pulse Mode, Check receiver is in Line Mode and check receiver is set to the relevant distance mode for lines* *see page 10.*

Q. ***I cannot get the receiver to pick up the rotating beam***
A. *Check receiver is in Rotating Mode Mode (Red Light next to power button on receiver). Note the receiver does not work when the rotating beam is in scan mode.*

Q. ***When I try to move the line lasers the laser stops working!***
A. *Tilt Mode may be activated so any movement of laser causes laser to shut down, de-activate tilt mode.* *see page 7.*

Q. ***The Laser does not power up!***
A. *Check the rechargeable batteries are charged and connected correctly and or replace standard "C" size Alkaline batteries and check they are inserted correctly.*

Q. ***Using the receiver I get multiple heights showing as level!***
A. *This is a common problem with all laser levels and is usually due to the laser being reflected off a window or other reflective surface. So the original laser beam plus the reflection are both hitting the receiver at slightly different heights. To prevent this, set the laser unit up so that you cannot see a reflective surface from where you are holding the receiver i.e. any glass behind receiver not the laser.*

REDBACK LASERS WARRANTY

Duration of warranty is fixed and automatic, when we advertise 2 years on a particular model, its two 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 8 Autumn St, Geelong West, Victoria 3218 ph (03) 5228 0777

"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 CXR880 Two 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. Ni-Mh Battery & Charger have 1 Year Warranty.

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-authorised 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.

RedBack Lasers™ distributed by CMI Industries Pty Ltd
P.O. Box 7324 - Geelong West - Victoria - 3218 - Australia
Ph: (03) 5228 0796 email: admin@redbacklasers.com.au