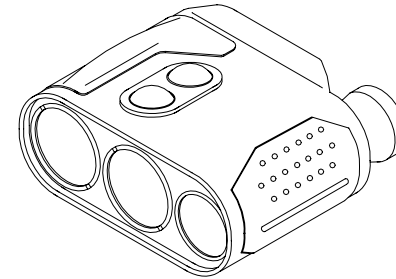




Operation Manual



LRM 2000PRO

LASER RANGE FINDER MONOCULAR

Newcon International Ltd. © 2005 Printed in Canada

In USA: 3310 Prospect Ave. Cleveland, OH 44115
In Canada: 105 Sparks Ave., Toronto, ON M2H 2S5

IMPORTANT INFORMATION

Read prior to activation

You have just purchased a complicated electronic device. To operate it properly, please read this manual carefully. Here are some common precautions that must be noted.

- **NEVER** subject the unit to impact while operating or being transported
- **NEVER** transport the unit without the case
- **NEVER** disassemble the unit. This device contains high voltage components, which may be hazardous to you!
- **NEVER** reverse the polarity of a battery
- **ALWAYS** remove batteries when not in use for a long period
- **ALWAYS** store in a warm dry place when not in use
- **Caution** - use of controls or adjustments, or performance of proceedings other than those specified herein may result in hazardous radiation exposure
- **Caution** - the use of some optical instruments with this product will increase eye hazard

10. QUALITY CERTIFICATE

The LRM 2000PRO is suited for usage.

Production date _____

Serial number _____

Quality Inspector signature _____

Purchase date _____

Salesman _____

9. CUSTOMER SUPPORT

Should you experience any difficulties with your Newcon OPTIK product, consult the enclosed manual. If the problem remains unresolved, contact our customer support department at (416) 663-6963 or Toll free at 1-877-398-6666. Our operating hours are 9am-5pm, Monday - Friday, Standard East Time.

At no time should the equipment be sent back to Newcon without following the instructions of our technical support department.

Newcon accepts no responsibility for unauthorized returns.

To locate NEWCON Authorized Dealer call:

Tel: (416) 663-6963 Fax: (416) 663-9065

Email: NEWCONSALES@NEWCON-OPTIK.COM

INTERNET: <http://WWW.NEWCON-OPTIK.COM>

The defective products should be shipped to:

In USA: 3310 Prospect Ave. Cleveland, OH 44115

In Canada: 105 Sparks Ave., Toronto, ON M2H 2S5

From International:

105 Sparks Ave., Toronto, ON M2H 2S5, CANADA

Features of the LRM 2000PRO Laser Range Finder Monocular

- Latest digital circuitry allows targeting through most types of glass
- First, last or the most reflective target acquisition
- Meters/Yards/Degrees/KMH/MPH display
- Last 10 readings recall
- Selectable reticle shape (+ or □)
- Target quality indicator
- Speed detector and compass

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8. WARRANTY

NEWCON OPTIK warrants this product against defects in material and workmanship for one year from the date of the original date of consumer's purchase, but no more than 18 months from the date of manufacturing. If your Newcon product proves to be defective during this period, please bring the product securely packaged in its original container or an equivalent, along with proof of the date of original purchase, to your Newcon Dealer. Newcon will repair (or at its option replace), the product or part thereof, which, on inspection by Newcon, is found to be defective in materials or workmanship.

What This Warranty Does Not Cover:

NEWCON is not responsible for warranty service should the product fail to be properly maintained or fail to function properly as a result of misuse, abuse, improper installation, neglect, damage caused by disasters such as fire, flood, lightning, improper electrical current, or service other than by a NEWCON Authorized Service. Postage, insurance, or shipping costs incurred in presenting your NEWCON product for warranty service are your responsibility. Please include a check or money order made out to NEWCON OPTIK for the amount of \$15.00 to cover shipping and handling. This covers products shipped in USA or Canada only.

7. TROUBLESHOOTING

The range-measuring mode does not work.

Press the Action button again.

Check that the battery is installed properly. Check the charge of the battery. Replace if it is weak.

How can I clear last reading before making next measurement?

Direct the unit's LCD reticle at the new target, press the Action button. The new reading will appear.

There are black dots in the image.

A LCD (Liquid Crystal Display) is installed in the optical channel of the device. Due to manufacturing imperfections in the production process of the LCD, small black dots, scratches and other blemishes might be visible. Those blemishes are strictly regulated for maximum allowed number, size and location. It does not degrade the product's performance.

Range measurement cannot be obtained.

- Check if range detection mode is activated (message READY appears on the LCD display)
- Check if Active button is pressed
- Make sure that neither your hand or finger is blocking objective lenses, laser emitting lens or receiver lens.
- Check if the unit is steady while you are pressing the Action button.

CAREFULLY READ ALL THE INSTRUCTIONS BEFORE USING!

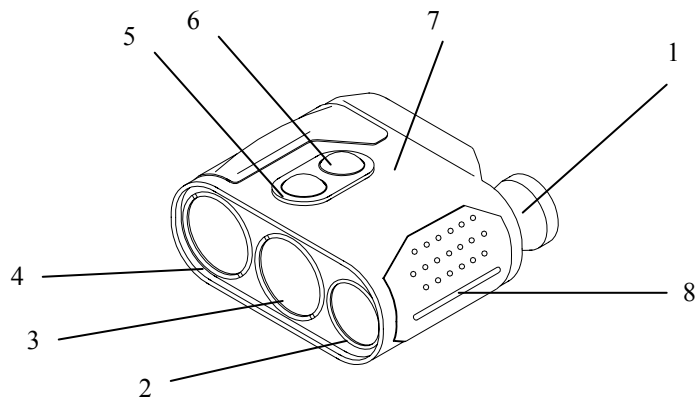
FAILURE TO OBEY THE INSTRUCTIONS WILL VOID THE WARRANTY!

1. BRIEF DESCRIPTION

LRM 2000PRO Laser Rangefinder Monocular is the advanced Laser Range Finder system that provides instant distance, speed, and angular measuring consistently and accurately. The outstanding optics provides a sharp, clear image under all conditions. LRM utilizes a revolutionary digital design, which outperforms any other product in its class and price range.

The unit sends an invisible, eye safe laser beam pulses to the target. The returned beams are captured by the digital circuitry. The time differential allows us to calculate the distance to the target. Incorporated digital compass measures clockwise the angle between the optical axis and direction to the North Pole.

2. APPEARANCE OF THE DEVICE



1 – Eyepiece; 2 – Objective lens; 3 – Laser emitting lens
4 – Receiver lens; 5 – **M** (Mode) button; 6 – **A** (Action) button;
7 – Body of the device; 8 – Rubber grip

Fig. 1

6. STORAGE AND MAINTENANCE INSTRUCTIONS.

Precautions: LRM is a sophisticated precision optical instrument equipped with electronics. Therefore, it should be handled with due care.

- Keep your device away from direct sunlight, impacts, dust, moisture, and sudden changes of temperatures.
- Do not keep the device at temperatures higher than 65°C (149°F).
- Do not touch the optical surfaces with fingers. Doing so may damage the anti-reflection coating.
- Avoid shocks and sharp jolts.
- Cleaning of optical surfaces is only allowed with professional camera lens cleaning supplies.
- To clean the exterior of the device, use a soft clean cloth.
- Keep away from heating appliances and central heating.
- Remove the batteries when storing the device for long period of time.
- Only the manufacturer can make repair works.

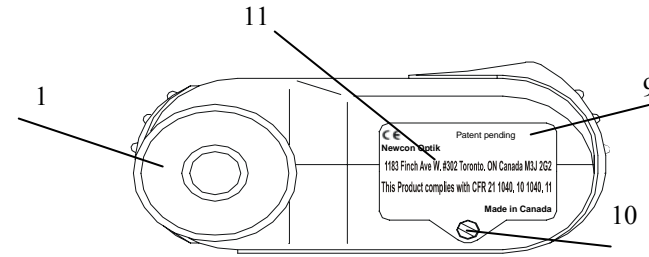
primary 9-volt battery drops below 7.2 volt. At this point the System is still functional but the battery should be replaced as soon as possible. The System can operate at the voltage level above 7 volt.

The System remains in the active displaying state for 8 seconds after pressing of any of the operating buttons and after 8 seconds it enters the passive zero power state. Alkaline or lithium type of batteries capable to sustain current drain up to 150 mA should be used for powering the System.

5.5. Test modes

Mode 16 is designated to test the display. When you choose this mode all segments and indicators will flash during 8 seconds. This time should be enough for extensive display testing.

Mode 17 calibrates the digital compass. If the System was exposed to a strong magnetic field or it was inoperable for a long time the compass stops working. This is normal. To return the compass back into working condition enter Mode 17 and rotate the System in horizontal plane during approximately one minute. The normal compass operation will be restored.



1 – Eyepiece; **9** – Battery compartment cover; **10** – Screw;
11- Identification label

Fig. 2

3. SUPPLIED ACCESSORIES

LRM is supplied in the following assembly:

- Device	1 pc.
- Carrying Case	1 pc.
- Neck Strap	1 pc.
- User’s manual	1 pc.
- Warranty card	1 pc.
- 9V battery (optional)	1 pc.

4. TECHNICAL CHARACTERISTICS

1. Optics	Magnification, x	7
	Objective Lens, mm	25
	Exit Pupil Diameter, mm	3.6
	Field of View	8°
	Type of Coating	Fully multi-coated optics
2. Range Finder	Type	Class 1, eye safe, 905nm
	Measuring Range, m	20 – 2,000
	Accuracy	± 1m ± 0.1%
	First, last and auto target acquisition	Yes
	Meters/Yards display	Yes
	Last 10 readings recall	Yes
	Reticle shape	+ or □
Target quality indicator	Yes	
3. Speed Detection	Measured speed range, kmH	5 – 400
	Accuracy, kmH	± 1
	KMH / MPH display	Yes
4. Compass	Measured azimuth range, degrees	360
	Accuracy, degrees	±2
5. Misc.	Battery (optional)	9 V
	'Low Battery' Indicator	Yes
	Tripod thread	¼" x 20
	Operational Temperature Range	-25 / +50°C (-13 / +122°F)
	Storage Temperature Range	-45 / +65°C (-49 / +149°F)
	Weight without battery, g	420
	Dimensions, mm	120 x 122 x 60

Distance measuring procedure includes instant statistical processing of the package of single measuring sessions for each laser pulse. Qualitative result of the statistical processing is presented on the Display as a message **TARGET REFLECTION (5)**.

There are four statistical qualifications of the reflected signal:

- **NO TARGET REFLECTION** – when a steady reflected signal isn't received. Numerical display shows four dashes at the distance displaying area;
- **TARGET REFLECTION LOW** – when the number of steady received reflected signals is just enough to make acceptable conclusion about the measured distance;
- **TARGET REFLECTION MED** - when the number of steady received reflected signals is in medium range and enough to make positive conclusion about the measured distance;
- **TARGET REFLECTION HIGH** - when the number of steady received reflected signals is qualified to be enough to make reliable conclusion about the measured distance.

The displayed statistical qualification of the reflected signal characterizes variation in expected accuracy of measurements. At qualification **HIGH** the accuracy of measurements is stated as $\pm 1m \pm 0.1\%$. At lower rates of statistical qualification the expected accuracy may marginally degrade.

The display presents message **LOW BAT** – when voltage of the

5.4. Additional display information

The System operates in the setting Modes that are displayed as follows (refer to Fig.3):

Y/M – units of measurement: yards or meters (3).

KMH/MPH – units of speed measurement: km/hour or miles/hour (3).

° - units of angular measurement: degrees (3)

Shape of the reticle: cross shape or rectangular shape (2).

rEC1 - recall function. Upon pressing the Action button (6) (fig. 1) the Display will sequentially show results of last 10 measurements, starting from the latest one. The number appearing after word "rEC" shows the number of the measurement counted back in the sequence. When the System is in inactive state the 10 previous measurements are stored within the System and may be recalled at any time.

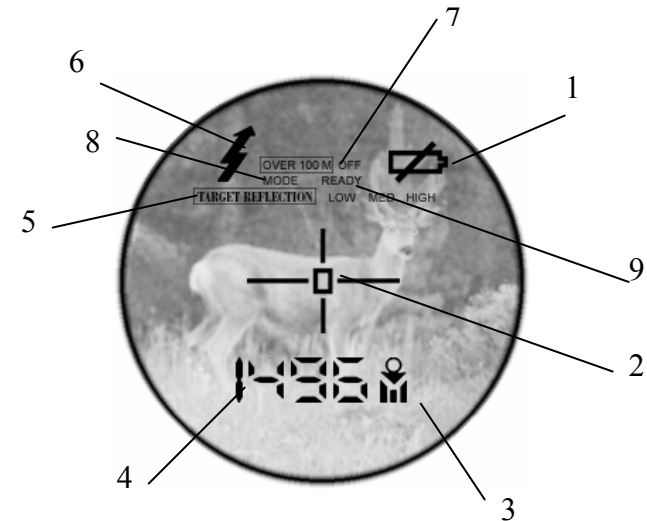
cLr - clear data function: upon pressing the **A** button (6) (fig. 1) the entire data on all previous measurements will be erased. This function doesn't change the chosen modes. You can erase the assigned mode only by assigning a new one.

Note: After changing a battery the recall stack should be cleared by exercising the **cLr** mode.

OVER 100 – indicates that gating is on. **Note:** This is an optional feature not necessarily presented in your device.

5. OPERATION INSTRUCTIONS

Liquid Crystal Display (LCD)



- 1 – Low battery indicator; 2 – Reticle (cross or rectangular selectable); 3 – Units of measurement (Yards, Meters, KMH, MPH, Degrees); 4 – Measurement result; 5 – Target quality indicator; 6 – Laser active indicator; 7 – Over 100m gating indicator (optional), 8 – Setup mode indicator, 9 – Ready mode indicator

Fig. 3

5.1. Preparing the device for operation.

- Unscrew the screw (10) and open battery compartment cover (9) (Fig. 2).
- Insert one 9V battery (sold separately) into the battery compartment observing correct polarity.
- Close the battery compartment cover (9) tighten screw (10).

After changing the battery, it is recommended to run the **cLr** (CLEAR) mode and Compass Calibration mode (refer mode selection procedure).

5.2. Measuring procedure

When the Rangefinder is in the passive, zero power consumption state, the LCD Display is blank (transparent). Press the **A** button (6) (Fig.1) and hold for 0.5 sec. to activate the System and the Display.

Initially the System always assumes **READY** mode of operation and word 'READY' appears on the Display.

Pressing and releasing **A** button (6) (Fig. 1) at this point triggers a measuring session, and the result will be displayed in numerical form (4) (if measurement is unsuccessful then four dashes '----' will appear in the numerical area). Please note that the target must be over 20m away. The measured data will correspond to the mode selected (see below). The units of measurement will be indicated in the field (3) (Fig.3). If you choose more than one parameter to measure (for instance, distance and azimuth), the measured results will appear on the display every half second.

For instance, Standard1 mode implies cross reticle. If you choose rectangular reticle (sub selection Code 10), you change the reticle shape and leave all other parameters of this mode intact. If then you choose Standard1 again, the reticle will turn back crosshair. The last set mode overwrites all features that it controls.

Another standard mode is assigned to Code 8. It determines measurement units and features as Yards, Degrees, Crosshair reticle, Auto target selection.

All other modes determine only one parameter to measure. For example, Code 14 allows to measure speed of the objects as kilometers per hour. The shape of reticle and target selection will remain the same, as they had been set before you selected the Code 14. Now you can choose a new reticle shape, still remaining in the speed measuring mode. This example demonstrates that Codes 9-13 replace one selected feature independently, and all other codes can replace more than one feature in a bunch.

If you want to leave the mode switching procedure without remembering your choice, you should press and keep held the **M** button for more than two seconds. This works like "Escape" key on a computer keyboard. The rangefinder will remain in the last set mode and return to the **READY** state.

Full trek of all possible modes available is depicted on Figure 4.

5.3. Mode switching procedure

By pressing **M** button (5) (Fig.1) when the System is in **READY** mode, you enter the Mode selecting state. Pressing the **M** button sequentially scans the Modes. The Mode under selection is indicated on the Display by flashing of the selectable feature. The "flashing" feature can be selected by pressing the **A** button (6). If you don't find some of the modes described below, it means they were not installed on your system. Two modes, "Codes" and "Recall" have submenus. You enter submenu by pressing the **A** button from the corresponding mode. After that you can select the sub-item with **M** button and choose your option by pressing the **A** button. Each time when you make your choice, you return to the **READY** state.

Note: Depending on user's requirements, the unit can be made with a special sub selection, providing only the options required for the particular task.

Note: Depending on the software installed the situation when the mode is accessible but inoperable also may occur.

There is one default preset mode, Standard1 (Meters, Degrees, Crosshair reticle, Auto target selection), which opens the mode trek. After you have selected it, you can override reticle type and target selection with the sub selection code.

If the **A** button is held (pressed) the System automatically enters **SCANNING** mode. At this mode, the System repetitively performs distance measuring and displaying. The time interval between measurements is approximately 0.25 second. The maximum measuring distance range for most objects will be about 2000 meters. The maximum measured distance varies greatly depending on the reflectivity of the target, weather conditions and more.

Target reflectivity depends on its color, surface finish, shape etc. Bright colors are more reflective than darks. A polished surface is more reflective than a rough one. Larger targets are easier for distance measuring. Measuring a target faced at 90° (perpendicular to the laser beams path) provides optimal results.

Bad weather conditions (rain, fog, snow, mist) will reduce the maximum measured range. Bright sunny days will reduce performance as well. While the unit will work through many glass types, measuring through glass will affect the results. Hand tremor also influences the results. Use tripod to measure distance to far-away objects.

The unit can estimate distance to up to 7 targets simultaneously. The mode selection logic allows choosing the nearest ('first'), the farthest ('last') or the most reflective ('auto') target. This mechanism helps to find correct target between bushes, wires, flakes, or, opposite, measure a distance to wire, which hangs in front of the building wall. However, it cannot be guaranteed that the device will always measure the needed distance. It can happen that there will be no pulses bounced off the desired object at all.

Mode	Screen display	Distance	Speed	Azimuth	Reticle	Target type
⏪ A 1) Standard1 Select this mode M ⏩ Codes Go to next mode	M ⏩ M - ° ° - - Go to next mode A ⏩ Go into submenu	Meter		Degree	- -	Auto Target
⏪ A Code1 Select this mode	M ⏩ Cd M Go to next mode	Meter				
⏪ A Code2 Select this mode	M ⏩ Cd 2 Y Go to next mode	Yard				
⏪ A Code3 Select this mode	M ⏩ Cd 3 - ° Go to next mode			Degree		
Not used	Cd 4					
Not used	Cd 5					
Not used	Cd 6					
Not used	Cd 7					
⏪ A Code8 Select this mode	M ⏩ Cd 8 Go to next mode	Yard		Degree	- -	Auto Target
⏪ A Code9 Select this mode	M ⏩ Cd 9 - - Go to next mode				- -	
⏪ A Code10 Select this mode	M ⏩ Cd 0 □ Go to next mode				□	

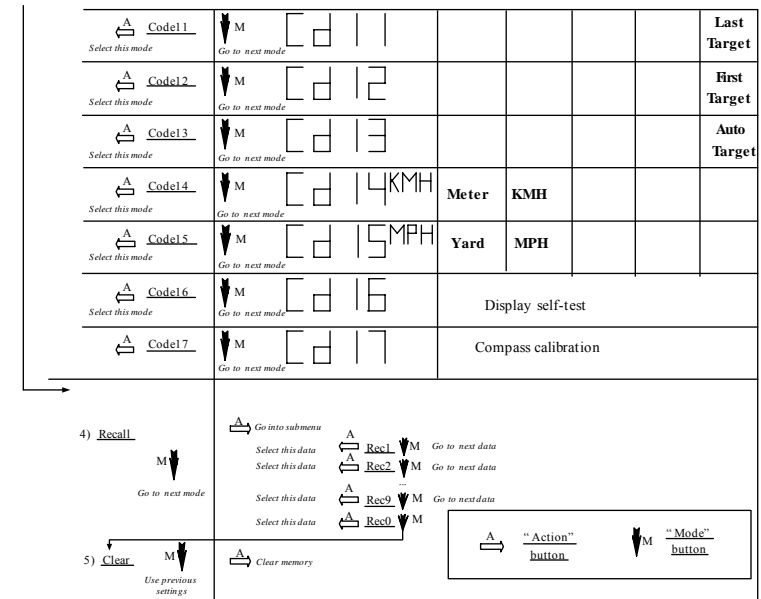


Fig.4 Mode switching trek