



KALINKA OPTICS WAREHOUSE USER MANUAL



VEBER LASER RANGEFINDER

LRF400 LRF600 LRF800 LRF1400 LRF1500



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OVERVIEW

INTRODUCTION

Thank you for choosing the VEBER® Laser Rangefinder (LRF) at Kalinka Optics! We are confident that the optic you have chosen will live up to your highest expectations.

Please, read this instruction manual carefully before using the rangefinder. This manual will guide you through the steps to properly use and maintain it for optimal performance. It also gives explicit technical information on construction and operating characteristics of this device.

Should you have questions that have not been addressed in this manual, please, contact us at info@kalinkaoptics.com. We will be happy to assist you.

GENERAL DESCRIPTION

The VEBER® LRF is a monocular optical viewing system with powerful rangefinding capabilities. It can be used to measure distances in yards or meters. LRF is available in the following versions:

LRF 400, LRF 600, LRF 800, LRF 1400, and LRF 1500.

Numbers in the model names correspond to the maximum range in meters that can be measured by a particular model. All models provide high rangefinding accuracy of up to ± 1 m.

Aside from the maximum range, some other features also vary depending on the model. That is why this MANUAL delivers explicit descriptions and specifications for each version of the VEBER® laser rangefinder (see below).

Protective features

The VEBER® rangefinder can be used in a variety of climatic conditions with temperatures ranging from -20°C to $+40^{\circ}\text{C}$ (-5°F to $+105^{\circ}\text{F}$), as well as in conditions of high humidity, dust and rain without risk of damage. The unit is also resistant to condensation and mold.

Lenses are covered by a high tech multilayer coating to optimize optical performance and resist scratches.

Operation

The user interface consists of two operation buttons and a convenient internal liquid crystal display (LCD) making setup and operation intuitively simple. The LCD incorporates illuminated indicators that advise the user unit of measure, targeting modes, battery status, measuring quality and results. These features are specified below.

Power supply

The VEBER® rangefinder is powered by either a CR-2 (3V) or 6F22 (9V) battery depending on the LRF model. Batteries of these types are always available at www.kalinkaoptics.com. It is recommended that you keep the battery out of the unit when it is not in use for a long time to extend battery life.

When out of power or without a battery, the rangefinder can be used as a plain optical observation monocular with 8x magnification.

Ocular

The VEBER® rangefinder's ocular is equipped with an extendable eyepiece, which makes it adjustable for various illuminance conditions. The exit pupil is a few millimeters away from the ocular lens. This feature gives a possibility of looking through the ocular in glasses or protective goggles.

Diopter adjustment is to be carried out by use of the eyepiece adjustment ring. Rotating this ring will help obtain a focused image.

Liquid crystal display (LCD)

The VEBER® LRF user interface is based on an internal liquid crystal display (LCD). The LCD allows the user to control measurement results, quality, units, mode, and status. It also indicates laser status and battery charge level (see Figure 2).

The VEBER® LRF1400 LCD appearance differs from other models because of expanded functionality. In addition to basic features, it indicates height and angle measurement parameters (see Figure 3).

Included With Purchase

- VEBER® laser rangefinder – 1
- Soft carry case – 1
- Carrying cord – 1
- Lens cleaning cloth – 1
- Service Manual – 1



Figure 1

RANGEFINDING

Rangefinding technique

The VEBER® rangefinder emits invisible, eyesafe, infrared energy pulses that reflect off the selected target back to its optical receiver. A digital unit incorporated in this device instantaneously calculates distances, by measuring the time it takes for each pulse to travel from the rangefinder to the target and back.

Rangefinding accuracy

Laser reflectivity and measurement results may vary depending on climatic and environmental conditions, the color, surface finish, size, shape and other characteristics of the target.

The brighter the color, the longer the range limit. Red is highly reflective, for example, and allows longer ranges than the color black, which is the least reflective color. A shiny finish provides more range than a dull one. A small target is more difficult to range than a larger target. The angle to the target also has an effect. Shooting to a target at a 90 degree angle (where the target surface is perpendicular to the flight path of the emitted energy pulses) provides good range while a steep angle on the other hand, provides limited ranging. In addition, lighting conditions (e.g. the amount of sunlight) will affect the ranging capabilities of the unit. The less light (e.g. overcast skies) the farther the unit's maximum range will be. Conversely, very sunny days will decrease the unit's maximum range.

Factors influencing rangefinding performance are summarized in the following lists:

Factors that ensure best range and accuracy

- Nighttime use
- Cloudy weather
- Bright-colored targets
- Targets with highly reflective surfaces
- Targets with shiny exteriors
- Large-size targets
- Shooting targets facing at 90 degrees

Factors that may cause inaccuracy or failure of measurement

- Slender or small target
- Target has diffusing reflective surface
- Target does not reflect the laser beam (transparent target)

- Black target
- Target has varying depths
- Measuring in heavy snow, rain or fog
- Target measured through glass
- Reflective surface measured from diagonal direction
- Moving target
- Obstacle moving in front of the target
- Targeting the surface of water

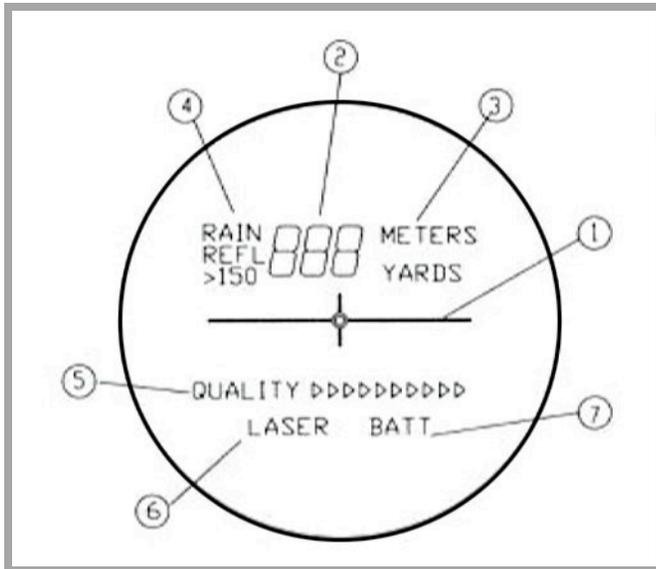
DESIGN AND OPERATION

SPECIFICATIONS

	V E B E R L R F M O D I F I C A T I O N S				
	LRF400	LRF600	LRF800	LRF1400	LRF1500
Maximum measured range	400m	600m	800m	1400m	1500m
Magnification	6x	6x	6x	8x	7x
Effective diameter of objective lens	25mm	25mm	25mm	30mm	25mm
Rangefinding accuracy	±1m	±1m	±1m	±1m	±1m
Angle measuring accuracy	-	-	-	±1°	-
Angle measuring range	-	-	-	0°...90°	-
Exit pupil	4mm	4.1mm	4mm	3.6m	3.5mm
Eye relief	14mm	14mm	14mm	14mm	14mm
Angular field of view	7°	7°	7°	7°	8°
Field of view at 1000m	122m	122m	122m	122m	140m
Operating temperature	-20°C...40°C	-20°C...40°C	-20°C...40°C	-20°C...40°C	-20°C...40°C
Power source	CR-2 (3V)	CR-2 (3V)	CR-2 (3V)	CR-2 (3V)	6F22 (9V)
Dimensions	40x120x71mm	40x120x77mm	41x120x70mm	45x135x80mm	50x122x112mm
Weight (approximately)	241g	199g	244g	278g	392g

LIQUID CRYSTAL DISPLAY INDICATORS

LCD indicators (for LRF400, LRF600, LRF 800, LRF1500)



LCD indicators:

1. Aiming mark
2. Distance/measurement status
3. Unit measure
4. Mode selection
5. Measuring quality
6. Laser status
7. Battery status

Figure 2

The LCD panel is integrated in the optical system and can be observed through the ocular of the rangefinder (see Figure 2). Once the power is on the aiming mark (1) formed by crosshairs in the middle of the display is lit. The mark is used for aiming at the target you want to measure distance to. Acquired measuring results (2) appear right above the aiming mark. If measurement is in progress or unsuccessful the "- -" sign shows instead of digits.

The unit measure indicators (3) are located in the upper right portion of the LCD and display either METERS or YARDS depending on the user's selection. Opposite to it, in the left portion is the mode selection indicator (4) that can display one of the following selections:

- No indication - normal mode
- RAIN - this mode is used in rainy conditions for rangefinding within 60 meters.
- REFL - this mode is intended for rangefinding in foggy conditions
- >150 - helps prevent influence of small obstacles located between the LRF and the target within a range of 150 meters.

The lower part of the LCD gives information on the current performance: measuring quality (5), laser (6) and battery (7) status indicators.

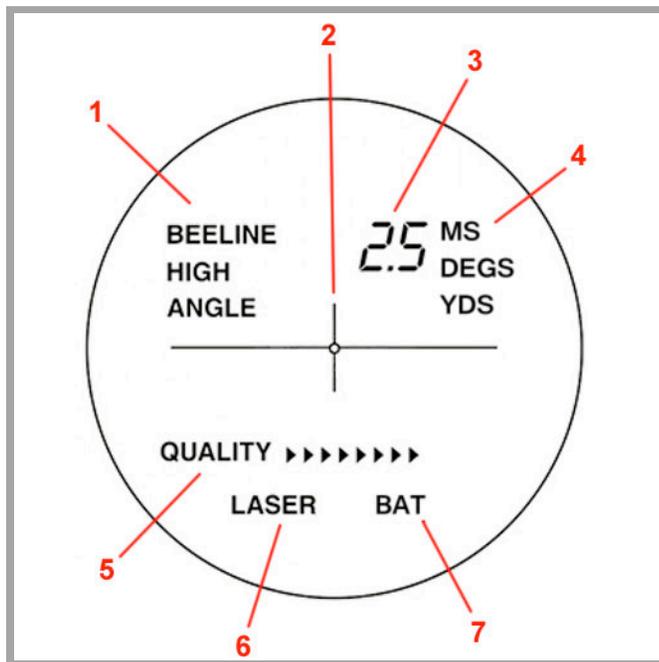
If you depress and hold the power button ON/ADJUST the sign LASER (6) in the lower left portion of the LCD will go flashing, indicating that the laser is actively firing and measuring is in progress.

Measuring quality is displayed by the number of active "▶" signs next to the QUALITY (5) sign located below the aiming mark. Six or more active "▶" signs indicate sufficient intensity of the reflected beam, which provides accurate rangefinding results.

The BATT indicator (7) in the lower right portion of the LCD goes off when the battery charge is low and the battery needs to be changed.

NOTE: VEBER® LRF1400 has a different LCD appearance (see below) due to expanded functionality of this model

LCD indicators (for LRF1400)



LCD indicators:

1. Mode selection
2. Aiming mark
3. Distance/height/angle/measurement status
4. Unit measure (METERS/DEGREES/YARDS)
5. Measuring quality
6. Laser status
7. Battery status

Figure 3

LRF1400 LCD panel integrated in the optical system and can be observed through the ocular of the rangefinder (see Figure 3). Aside from angle/height measuring indicators, LRF1400 display design is similar to other VEBER® rangefinder models.

The flashing crosshair aiming mark (2) in the middle of the display indicates that the power is on and the device is operable. The mark is used for aiming at the target you want to measure the distance to.

Acquired measuring results (3) appear right above the aiming mark. This indicator can display either digits representing distance reading or the "- -" sign if no measurement has been taken. The LCD shows no digits and sign "END" comes up on the display in case of deficient measurement quality usually caused by poor reflectivity.

The unit measure indicators (4) are located in the upper right portion of the LCD and have the following options:

- MS - meters
- DEGS - degrees
- YDS - yards

Opposite to it, in the left portion is the mode selection indicator (1) whose status can be as follows:

- No indication - point-to-point distance measurement (normal mode)
- BEELINE - horizontal distance measurement
- HIGH - object's height relative to the viewer's eye
- ANGLE - tilt angle with respect to horizon

The lower part of the LCD is similar to these of other VEBER® LRF models and gives information on the current performance: measuring quality (5), laser (6) and battery (7) status.

If you depress and hold the power button ON/ADJUST the sign LASER (6) in the lower left portion of the LCD will go flashing, indicating that the laser is actively firing and measuring is in progress.

Measuring quality is displayed by the number of active "▶" signs next to the QUALITY sign (5) located below the aiming mark. Six or more active "▶" signs indicate sufficient intensity of the reflected beam, which provides accurate rangefinding results.

The BATT indicator (7) in the lower right portion of the LCD goes off when the battery charge level is low and the battery needs to be changed.

OPERATION

Operational summary (for LRF400, LRF600, LRF 800, LRF1500)

Install a battery in the **battery compartment**. Make sure that the right polarity is observed. Close the compartment tightly by putting the **protective cap** back in place. The cap goes in clockwise. Please refer to PARTS & CONTROLS section (see Figures 5 through 8 depending on your model) for visual identification.

Looking through the **ocular** locate your target object. Rotate the **eyepiece adjustment ring** until the object comes into focus.

Depress the **ON/ADJUST button** to activate the rangefinding system with the LCD panel. Once the LCD is active it displays the aiming mark and the current measuring mode (see Figure 2). Usually, the normal mode (no indication) is selected by default. Using the **MODE button** select another mode if necessary.

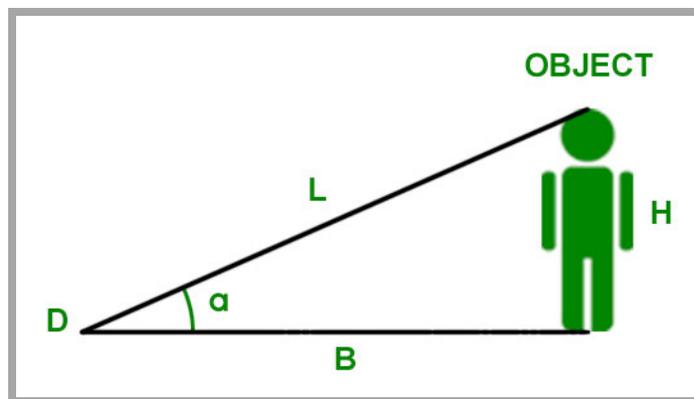
Place the aiming mark (1) upon the target object. Depress and hold the **ON/ADJUST button** down for approximately 3 seconds until the range reading (2) is displayed above the aiming mark. If reflected laser pulses are not intensive enough for being detected the " - - " sign appears on the LCD instead of digits, indicating that measurement is unsuccessful. In this case you may want to repeat the measurement procedure holding the power button depressed slightly longer than 3 seconds to allow the system more time for more precise rangefinding.

Unit of measure (METERS or YARDS) can be changed by depressing and holding the **MODE button** for over 3 seconds. Once selection has been changed, release the button.

If the rangefinding system is not in use for over 15 seconds, it turns off automatically.

Operational summary (for LRF1400)

Due to expanded operational functions LRF1400 holds an outstanding position in the VEBER® LRF product line. In addition to the regular rangefinding capabilities described above, LRF1400 allows to measure angular height of an object (see Figure 4). That is why its LCD interface is slightly different from other models (see Figure 3). Nevertheless, operational logic remains the same.



Notation:

- D** - LRF's location point
- L** - point-to-point distance
- H** - target object's height
- B** - distance to the object in the horizontal plane
- α** - LRF's tilt angle

Figure 4

Install a battery in the **battery compartment** watching polarity. Close the compartment tightly by putting the **protective cap** back in place. The cap goes in clockwise. Please, be referred to PARTS & CONTROLS section (Figure 9) for visual identification.

Looking through the **ocular** locate your target object. Rotate the **eyepiece adjustment ring** until the object comes into focus.

Depress the **ON/ADJUST button** to activate the rangefinding system with the LCD panel. Once the LCD is active it displays the aiming mark and the current measuring mode (see Figure 3). Usually, the normal mode (no indication) is selected by default. Using the **MODE button** select another mode if necessary.

Place the aiming mark (2) upon the target object you chose. Until measuring is completed above the aiming mark the " - - - " sign is displayed instead of measuring results (3).

Depress and hold the **ON/ADJUST button** down for approximately 3 seconds until the range reading result (3) is on. If the reflected laser beam is not intensive enough for being detected the LCD shows no digits and sign "END" appears on the display, indicating that measurement is unsuccessful. In this case you may want to repeat measurement holding the power button depressed slightly longer than 3 seconds to allow the system more time for more precise rangefinding.

The **MODE button** allows switching over to other measuring procedures. Press the button once to select the BEELINE mode (horizontal distance measurement). Press it twice for HIGH and three times for ANGLE, i.e. for measuring height of an object or tilt angle respectively.

Once another mode is selected measuring results can be obtained by using the same operational technique as it is described above for normal rangefinding.

The minimum distance to an object for rangefinding modes is 5-7 meters. Measuring distances to closer objects may either fail or introduce error into the measurement results. The upper limit is 1400 meters as it is designated in the model name.

Angle measurements can be taken within the range of 0-90 degrees. Blunt angles cannot be measured.

Unit of measure (METERS or YARDS) can be changed by depressing and holding the **MODE button** for over 2 seconds. Once selection has been changed, release the button.

If the rangefinding system is not in use for over 15 seconds, it turns off automatically.

PARTS AND CONTROLS

VEBER® LRF400



Nomenclature:

1. Battery compartment cap
2. Battery compartment
3. Monocular eyepiece with adjustment ring
4. ON/ADJUST button
5. MODE button
6. Laser detector aperture
7. Monocular objective lens / Laser emission aperture

Figure 5

VEBER® LRF600



Figure 6

Nomenclature:

1. Monocular eyepiece with adjustment ring
2. MODE button
3. ON/ADJUST button
4. Monocular objective lens / Laser emission aperture
5. Battery compartment
6. Laser detector aperture

VEBER® LRF800



Figure 7

Nomenclature:

1. Monocular eyepiece with adjustment ring
2. MODE button
3. ON/ADJUST button
4. Monocular objective lens / Laser emission aperture
5. Battery compartment
6. Laser detector aperture

VEBER® LRF1500



Figure 8

Nomenclature:

1. Battery compartment
2. ON/ADJUST button
3. MODE button
4. Monocular eyepiece
5. Monocular objective lens
6. Laser emission aperture
7. Laser detector aperture

VEBER® LRF1400



Figure 9

Nomenclature:

1. Monocular eyepiece
2. Monocular objective lens / Laser emission aperture
3. Battery compartment
4. MODE button
5. ON/ADJUST button
6. Laser detector aperture
7. Battery compartment cap

SAFETY AND MAINTENANCE REQUIREMENTS

SAFETY PRECAUTIONS AND STORAGE REQUIREMENTS

Cautions

- When not using the LRF, do not push the power button.
- Do not leave the LRF within the reach of small children.
- Never look at the Sun directly through the ocular without shading devices.
- Water, sand and mud should be removed from the rangefinder body surface as soon as possible, using a soft, clean, dry cloth. Do not use alcohol for cleaning the main body.
- Prevent lenses from contacting with anything but special soft lens cleaning cloth.
- Although the LRF is waterproof, it is not designed for use underwater.
- Do not leave the LRF in a car on a hot or sunny day, or near heat-generating equipment. This may damage or negatively affect it.
- Do not leave the LRF in direct sunlight. Ultraviolet rays and excessive heat may negatively affect or even damage the unit.
- When the LRF is exposed to sudden changes in temperature, slight water condensation may occur on lens surfaces. Do not use the product until the condensation has evaporated.
- When not in use store the LRF in the soft case at all times.
- If your LRF should fail to operate correctly and you are unable to fix the problem, discontinue use immediately and contact your local dealer for instructions. Do not dismantle the unit on your own.
- Do not press both ON/ADJUST and MODE buttons simultaneously
- The unit is to be used at the specified temperatures ranging from -20°C to +40°C.
- Pay attention to polarity when inserting a battery. Wrong polarity may damage the unit.

Storage

- Water condensation or mold may occur on the lens surface because of high humidity or sudden temperature change. Therefore, store the LRF in a cool and dry place.
- If the unit has been used in the rain or in conditions of excessive humidity, thoroughly dry it at room temperature, then store in a cool, dry place.
- Keep the battery out of the unit when it is not in use for a long time to extend battery life.

CLEANING

- Use a soft oil-free brush for removing dust on the lens surface.
- When removing stains or smudges like fingerprints from the lens surface, wipe the lenses very gently with a soft clean cotton cloth or quality oil-free lens tissue. Use a small quantity of pure alcohol (not denatured) to wipe stubborn smudges.
- Do not use velvet cloth or any coarse tissue that may scratch the lens surface.
- Clean the main body surface with a soft, clean cloth and a dry cloth. Do not use benzene, thinner, alcohol or other organic agents. Once the cloth has been used for cleaning the body, it should not be used again for the lens surface.

WARRANTY

This device meets or exceeds the quality standards set forth by the manufacturer and its technical specifications match those listed in this manual.

Kalinka Optics Warehouse® offers its Unbeatable Full 12-month Factory Warranty on all products sold against defects in workmanship and materials for one year from date of purchase. Absolutely no returns or warranty claims will be processed without a Return Authorization Number, see the site for details. If maintenance or feasible and justifiable repairs have to be done upon expiration of the warranty period, all costs related to these services are the responsibility of the customer.

Thanks for Shopping with US!

For further questions or additional information please contact:

KalinkaOptics Inc.
4705 Southport Supply Rd, Suite 208
Southport, NC 28461, USA

E-mail: info@kalinkaoptics.com
Phone: +1 910-454-8194