

# QUAD 4000 OWNERS MANUAL

## ONE MAN LAYOUT AND CONTROL



## LINE, SQUARE, LEVEL & PLUMB ALL IN ONE – ALL AT ONCE.

U.S. Patent No. 7266897 & Patent Pending

Designed and built in Redmond, Oregon

**LASERLINE MFG, INC.**



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## THE SYSTEM OVERVIEW

The Quad 4000 long range layout and control laser system with LineLokr Technology (LLT) enables you to square your job, control elevation, snap your lines and plumb a structure with just one person, using just one laser, and often from one setup. The Quad 4000 was designed from the ground up to provide accurate layout and control functions while at the same time being easy to use.

LineLokr Technology (LLT) is the cornerstone of the system for layout, Line control, squaring and plumbing. The LineLokr communicates with the Quad 4000 laser automatically driving the laser to centerline and holding it there all day long. Line, square and plumb will not drift off because it is always being monitored and corrected back to line via the LineLokr communication.

### THE LASERLINE 4000 QUAD PROVIDES

- Level control covering a 1500 foot radius
- Line Control to  $\pm 1/16$  inch @ 600 feet
- Squaring left and right from center to within  $\pm 1/16$  inch per 100 feet
- Plumb control to within  $\pm 3/32$  per 100 vertical feet

The Quad will automatically default to vertical control when turned on. You can select horizontal only or vertical and horizontal using the "Mode" button on the far left.



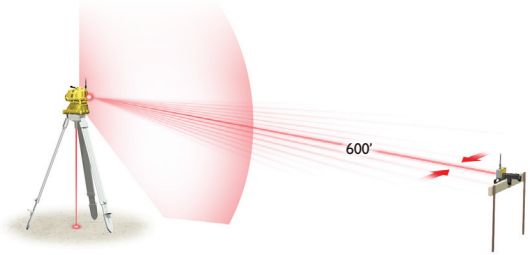
VERSITAL | ACCURATE | EASY TO USE

## ALL IN ONE, ALL AT ONCE.

Square your job, control elevation, snap your lines and plumb the structure with just one man at one time, with one laser, from one setup. It's easy to use and accurate!

### 1 LINE LOCKING

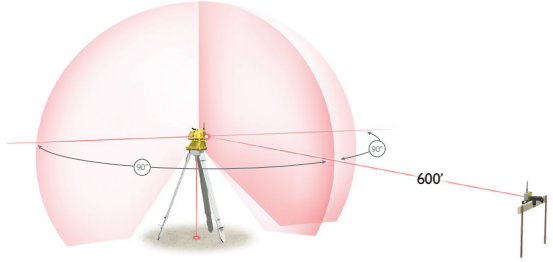
The Quad 4000 sets up on a tripod like a standard instrument. It has a downward pointing laser plummet through the center of the unit, allowing you to easily get over your point. No offsets! Once rough aimed within its line adjust limit, the system will create a vertical plane forward of the Quad 4000 that will automatically seek the LineLokr module at your second point, lock on, and then stay locked onto your far point. Line can be locked up to 600 feet!



### 2 SQUARE

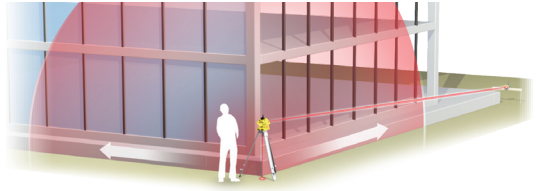
Once locked to your far point, the Quad 4000 then simultaneously transmits a rotating plane of light at  $90^\circ$  angle left and right from your baseline.

This creates a 600 foot square left and right of centerline for any squaring application such as building, structures, foundations, etc.



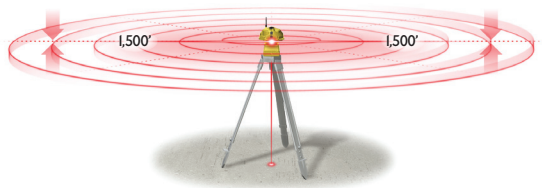
### 3 PLUMB

Since the Quad 4000 produces a vertical plane of light along your baseline in front of the laser, plus a vertical plane of light both left and right at  $90^\circ$ , it allows you to plumb two sides of a structure simultaneously from one setup. The Quad 4000 not only plumbs, but squares and controls rack along the the entire vertical surface of your structure. For shaft work, it provides plumb, square and rack control on all four sides of the interior wall structure at the same time.



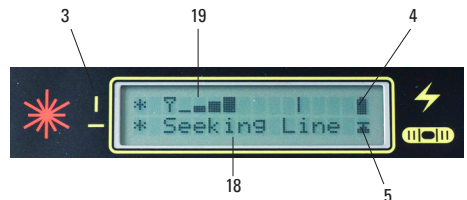
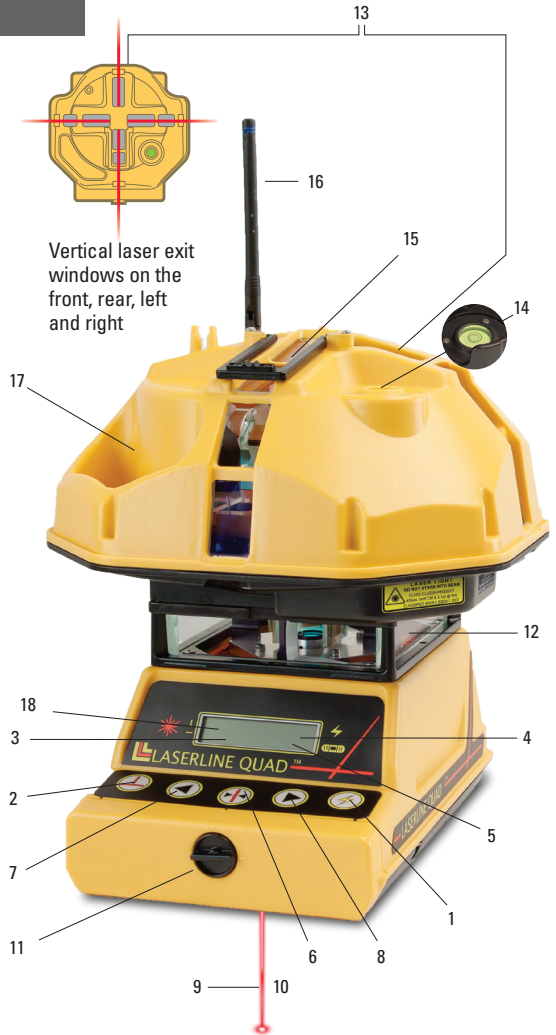
### 4 LEVEL

While the Quad 4000 is producing line and square, it can also transmit a  $360^\circ$  level plane over the entire job site. This allows for multiple uses. A single person can establish line, as well as grade, in applications such as screed lines, foundation work and setting templates to name a few.



## QUAD 4000 CONTROLS & FEATURES

- Power Button:** System defaults to vertical and will start "seeking" the LineLokr (LL) automatically. If LineLokr is not turned on, the display reads "No Signal"
- Mode Button:** You can select "Horizontal Mode" or "Vertical and Horizontal Mode" by toggling the button
- Mode Status:** Indicates what mode you are in 1 Vertical Mode, 2 Horizontal Mode, 3 Vertical & Horizontal
- Battery Status:** Indicates approximate battery life
- Self-Leveling Status:** Indicates if unit is in process of leveling, or if it is level
- Manual Line Mode Button:** The Quad 4000 can manually be adjusted for line if LineLokr is not used
- Manual Line Left:** With the Quad in "Manual Line Mode", depressing this button drives laser to the left
- Manual Line Right:** With the Quad in "Manual Line Mode", depressing this button drives laser to the right
- Laser Plumb Bob:** Used to set Quad over a point when in vertical & horizontal mode or vertical only mode. Plumb-bob laser shuts off after 3 minutes to save battery power
- 5/8x11 Mount:** On bottom side of Quad for tripod mounting
- Battery Door Knob:** Turn ¼ turn to left to open door (Takes 4ea. D cell Alkaline batteries)
- Horizontal (Level) Exit Window:** Provides 360° level control for your jobsite
- Vertical Laser Exit Windows:** Provides line, square and plumb control for your jobsite
- Bulls Eye Bubble:** For leveling to bring the Quad within its self-leveling range
- Sighting Device:** For aiming the Quad to the LineLokr
- Communication Antenna:** Receives signal from the LineLokr to drive laser left or right for centerline
- Molded Carrying Handle:** Allows easy and sure handling of the Quad 4000
- LCD Display:** Displays function status of the Quad 4000
- Radio Signal Strength:** Displays signal strength between Quad and LinLokr™



**NOTE: Automatic Shutoff Feature:** If after initial setup, the Quad 4000 is bumped or moved, the system shuts down to avoid line, square, plumb or level errors from occurring.

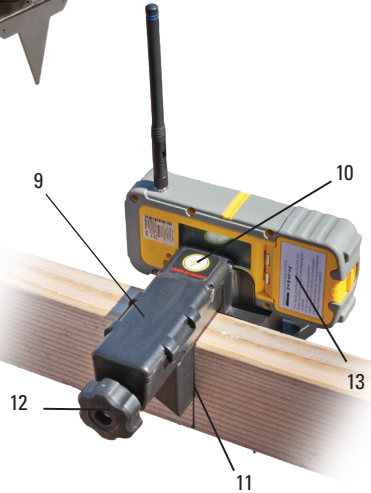
**LINELOKR™**

**LINELOKR™ TECHNOLOGY (LLT) AUTOMATICALLY LOCKS YOUR LASER ONLINE AND KEEPS IT THERE UP TO 600 FEET AWAY.**

LLT provides a two-way communication between the Quad 4000 Laser and the LineLokr Line Control Module for vertical control applications such as plumb, squaring and line layout.

LLT allows you to setup your laser at one point and then merely push a button to obtain line. The Quad 4000 and LineLokr communicate via a special radio link causing the Quad 4000 to automatically drive itself to centerline and lock onto your far point. The Quad 4000 and LineLokr continuously communicate to maintain centerline and will not drift off due to wind and temperature changes throughout the day.

1. **Power Button:** Depress to activate LineLokr and communicate with the Quad 4000 (When first activated, unit will Self Test Mode 4 seconds) When turning off, hold power button down for two seconds
2. **MM/Inches Button:** Changes display only – Not operational in LineLokr
3. **Speaker Button:** Increase or decrease volume
4. **Widen/Narrow Deadband Button:** Regardless of the LCD display, the LineLokr will continue to lock to the highest possible accuracy (LineLokr accuracy is not affected by deadband setting)
5. **LCD Display:** Indicates whether Quad 4000 is driving left, driving right or is on center and locked on line.
6. **Leveling Screws:** Used to level the bulls eye bubble when the LineLokr is mounted on a tripod in order to get the laser plumb bob (8) over your point
7. **Bulls Eye Bubble:** Used when LineLokr is mounted to tripod or floor to insure laser plumb bob is plumb and over your point
8. **Laser Plumb Bob:** For tripod set up, allows you to set LineLokr over your point
9. **Laser Plumb Bob Battery Door Access:** For laser plumb bob battery access (4ea. Alkaline batteries)
10. **Laser Plumb Bob Power Button:** Activates laser plumb bob; Automatically turns off after 3 minutes to save battery power
11. **Batter Board Line Indicator:** Lines up with line reference on the batter board to get LineLokr on line
12. **Batter Board Lock Knob:** Used to attach and tighten LineLokr to batter board
13. **LineLokr Battery Door:** Allows access to LineLokr batteries (2ea. AA Alkaline batteries)
14. **LineLokr Communication Antenna:** Sends Line control information to Quad – drive right, drive left for centerline and “locked on”



## WHAT HAPPENS WHEN YOU POWER UP THE QUAD AND LINELOKR?

When powered up, the Quad will automatically default to vertical mode control functions.

1. The Quad will start self-leveling and the downward shooting laser plumb bob will be activated.
2. Only the vertical laser coming out of the front of the Quad will come on until it locks on to the LineLokr at centerline. Once line is locked, and the Quad has leveled, then all vertical planes are activated. This is a safety feature to insure that someone cannot use the vertical reference until the Quad is in its proper alignment, line locked, and level.



**NOTE:** If the LineLokr is not powered up then the Quad 4000 will display "No Signal." Once you power up the LineLokr the display will briefly show "Seeking Line." This lets you know that the laser and the LineLokr are communicating and will show you the strength of the radio communication between the Quad and the LineLokr.

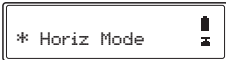
### THE QUAD DISPLAY STATUS



### QUAD DISPLAY INFORMATION



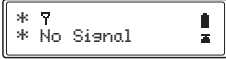
Quad 4000 is providing line, square and plumb only. (Quad 4000 defaults to this mode when powered up)



Quad 4000 is providing level control only.



Quad 4000 is providing line, square, plumb and level.



Quad 4000 and LineLokr are not communicating.



Briefly displayed when the Quad 4000 and LineLokr are communicating.



Laser is driving to the left looking for the LineLokr.



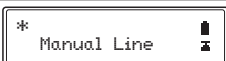
Laser is driving to the right, looking for LineLokr.



Quad 4000 has found the LineLokr and is driving to center.  
▶|◀ (Flashes until locked on.)



Quad 4000 is locked on to line and will continue to correct to center until shut off.  
▶|◀ (Steady when locked on.)



Is activated by depressing the center button (◀▶) Quad will not automatically seek line. Line must be obtained by pressing to drive line right (▶) and to drive line left (◀) when using a standard laser detector instead of the LineLokr to establish line.



### **AUTO LINE RESET FEATURE**

If the signal between the Quad 4000 and the LineLokr is blocked, the display will read "NO SIGNAL" then after one minute the system will shut down and then begin automatically searching for line again. During the searching process time the 90° lasers are shut off so that you cannot take an inaccurate shot. Once the Quad 4000 is again locked to line, then the 90° beams are reactivated and you're ready to go back to squaring or plumbing.

(This function does not work if the unit is in the manual line mode)

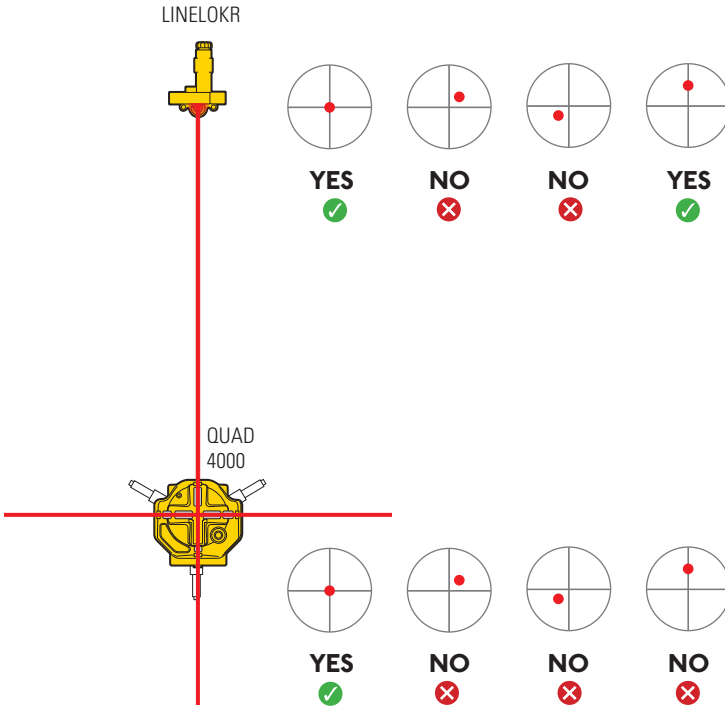
### **QUAD 4000 KNOCKED/DISTURBED AUTO SHUT DOWN FEATURE**

If the quad 4000 is operating in the "Vertical Mode" and gets jostled or disturbed, the system will shut down, so that no bad line or grade shots can be taken.

The Quad 4000 must then be reset which allows you to insure that the Quad is directly over your point for maximum line, square and plumb accuracy.

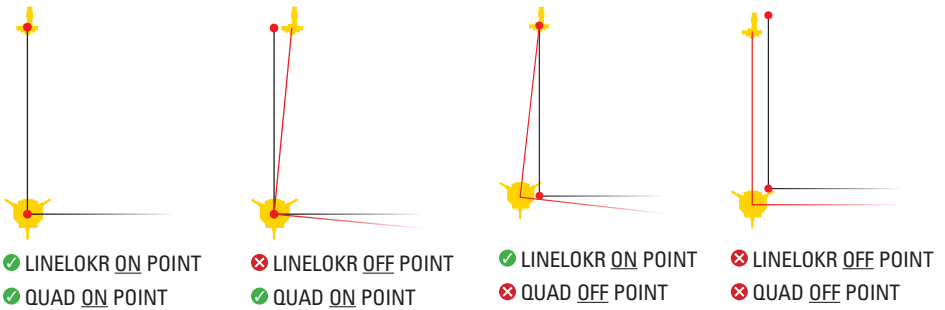
**ANGULAR (SQUARE) ACCURACY ON THE JOBSITE IS PRIMARILY AFFECTED BY TWO THINGS:**

1. The accuracy of the Quad 4000 being  $\pm 1/16$  per 100 feet
2. How close you are on your set up to having The Quad 4000 and The LineLokr DIRECTLY over your point



**FOR LINE, SQUARING AND PLUMB, GET TO THE POINT!**

GET DIRECTLY OVER YOUR POINT OR YOU WILL BE OFF



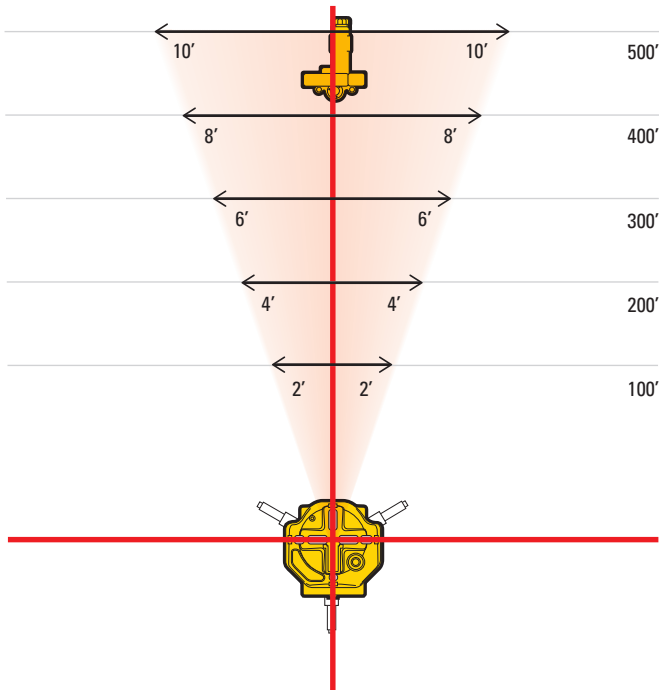
## SETUP CONSIDERATIONS WHEN USING THE LINELOKR

The LineLokr™ is a control device that communicates with the Quad 4000 via radio transmission. When the Quad 4000 receives a signal from the LineLokr the Quad 4000 will begin to search left and right to find the LineLokr. Once the Quad 4000 laser strikes the active photocell of the LineLokr the Quad will slowly drive to the center and lock on. The normal operating range of the LineLokr is 600 feet assuming that the Quad 4000 and the LineLokr are both about three to four feet or more off the ground (mounted to tripods)

### THE ACTUAL RANGE CAN VARY DEPENDING ON CONDITIONS SUCH AS:

- HEIGHT OFF THE GROUND (HIGHER IS BETTER)
- SPARKING OR WELDING OPERATION NEARBY
- IN SOME CASES, THE TYPE OF OUTDOOR LIGHTING
- HIGH WINDS BUFFETING THE LASER AND LINELOKR
- RADIO INTERFERENCE FROM AN OUTSIDE SOURCE

### TOTAL LINE ADJUST LEFT AND RIGHT AT DISTANCE



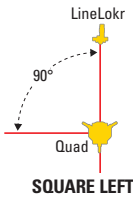
**NOTE:** The shorter the distance from the Quad to the LineLokr the more critical the rough aiming. LineLokr time is dependent on distance, aiming, ambient temperature and battery power. Normally The Quad 4000 will line lock in about one or two minutes.



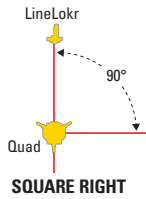
**NOTE:** When mounting the LineLokr to a tripod, use a standard tribrach and 5/8 thread tribrach adapter. Level tribrach using bulls eye bubble on the tribrach, disregarding the bubble on the LineLokr.

## LET'S GET STARTED

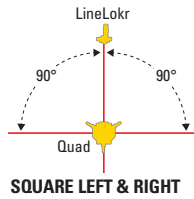
### **A** LINE, SQUARE & PLUMB: YOU CAN SQUARE LEFT AND RIGHT FROM YOUR BASE LINE.



**SQUARE LEFT**



**SQUARE RIGHT**



**SQUARE LEFT & RIGHT**

- ① Set up LineLokr on centerline of far point, turn on power ⏻ and raise antenna. If using a tripod, make sure the LineLokr bullseye bubble is level and the plumb bob laser spot is directly over your point.
- ② Set up Quad at corner point that you want to square off of or center point to square left and right at one time as illustrated above.
- ③ Power up the Quad 4000 ⏻ and make sure the antenna is in the upright position. When powered up, the Quad will automatically default to the 'VERTICAL' mode for the line, square and plumb applications.
- ④ Level the bullseye bubble on the Quad by extending or contracting the tripod legs.
- ⑤ Adjust the Quad directly over your point using the laser plumb bob (readjust tripod if necessary to get over point)
- ⑥ Aim the Quad at the LineLokr using sighting device (recheck and make sure you are still directly over your point) The Quad 4000 will automatically seek the LineLokr and lock on to line. Once locked on, the Quad will transmit both vertical lasers for line, square and plumb.

DISPLAY WILL READ:

SEEKING LEFT/RIGHT



LOCKING LINE

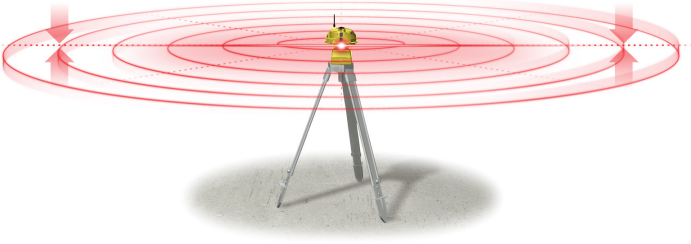


LINE LOCKED

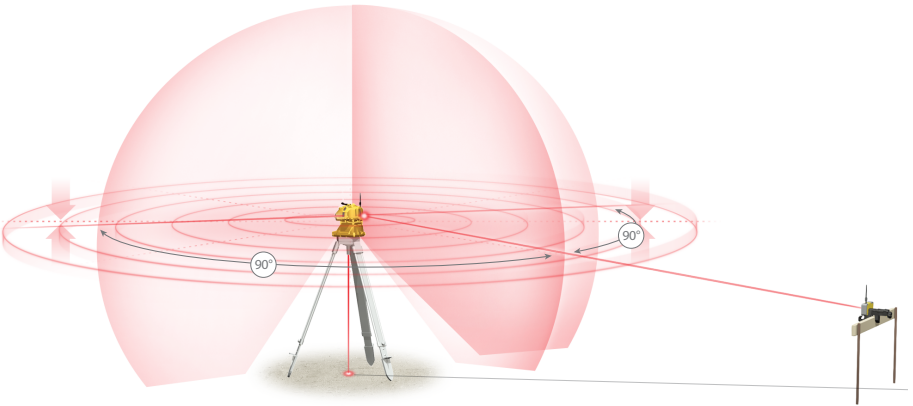
**YOU ARE READY TO GO TO WORK!**



**NOTE:** The key to achieving the most precise results for line, squaring and plumb applications is making sure the Quad 4000 is directly over the center point and the LineLokr is directly on centerline at your far point.

**B LEVELING ONLY: FOR ALL LEVELLING TASKS**

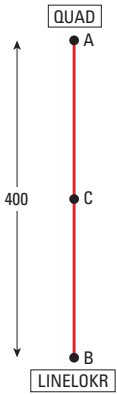
- ① Set up Quad 4000 on the tripod and level Quad bulls eye bubble by extending or contracting the tripod legs
- ② Power up Quad ⏻
- ③ Using "Mode" ⏻ button toggle until "Horiz Mode" is displayed on the control panel. Quad 4000 will automatically self-adjust to level. Once level, the horizontal laser will begin transmitting a 360° signal. (Self-leveling time is about 15 seconds)

**C LINE, SQUARING, PLUMB AND LEVEL (ALL FUNCTIONS AT ONCE)**

Follow steps ① - ② in **A** (reverse side), but after ③ powering up with Quad 4000, depress ⏻ (mode button) until display reads "Vert + Horiz" then follow steps ④, ⑤ and ⑥.

# CHECKING FOR SQUARE ACCURACY OF THE QUAD 4000

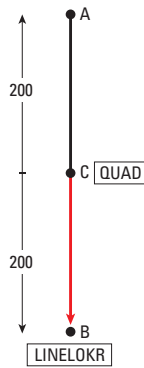
1



Using the Quad 4000 and the LineLokr, strike a line at least 200 feet (400+ is better) and mark both ends and midpoint

**NOTE:** Always use the finest "on-line" setting on your laser detector for establishing all your line reference points in steps 1 through 5.

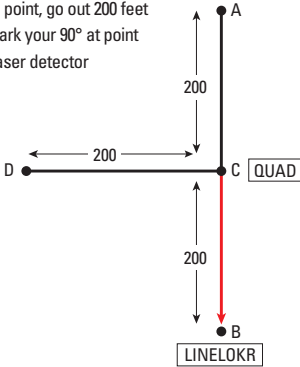
2



Set Quad at middle point on point (C)  
Relock to LineLokr at point (B)

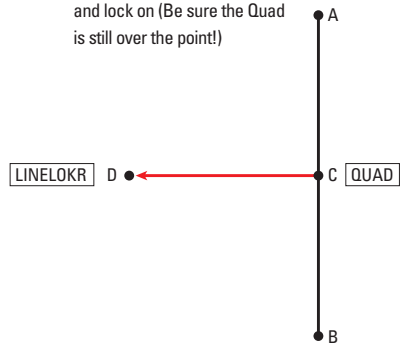
3

From (C) mid point, go out 200 feet to left and mark your 90° at point (D) using a laser detector



4

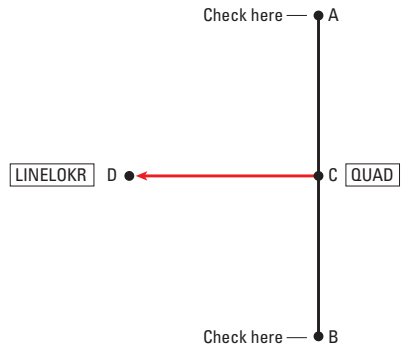
Move LineLokr to (D) point. Rotate Quad aiming to LineLokr and lock on (Be sure the Quad is still over the point!)



5

Using a laser detector, go to (A) and (B) and measure where the laser is relative to your (A) and (B) points. This will indicate your square accuracy over the distance from the Quad. (i.e. at 200 feet 1/8 inch= 1/16 per hundred or 10 arc seconds accuracy)

**NOTE:** Angle error read at points A & B will be 2 times the true error. (i.e., 1/4 inch off at point A would actually be 1/8 in 200 feet, or 1/16 in 100 feet.)



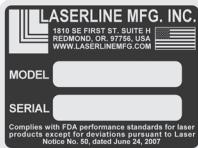
**NOTE:** Insure that you are precisely establishing your points and that you are precisely setting up over those points in order to obtain maximum accuracy for this field calibration check.

## CHECKING FOR LEVEL ACCURACY OF THE QUAD 4000

1. Set the Quad 4000 on a 5/8x11 tripod at least 100 feet from a wall surface
2. Level the tripod head using the bulls eye bubble on the Quad 4000 by raising or lowering the tripod legs until the bulls eye bubble is centered
3. Aim the Quad 4000 at the wall using the sighting device on the top of the Quad
4. Turn the power on and select the "Horizontal Mode" and allow the unit to level up
5. Place your laser detector on the "Fine" or narrowest dead band setting and locate the "ON GRADE" signal against the wall that you have aimed the laser at and mark this spot.
6. Rotate the Quad 4000 180°
7. Find "ON GRADE" on the wall at the same location as your first mark
8. The two marks should be within 1/16 of each other at 100 feet from the laser to the wall for the Quad 4000 to be within its level spec. ( $\pm 1/16$  per 10 linear feet-10 arc seconds)
9. Repeat the above process by aiming the laser out of the right and left sides to determine if the Quad is level on that axis as well ( $\pm 1/16$  within)

## LASER SAFETY

For safe operation read all the user guide information and instructions



IDENTIFICATION CERTIFICATION



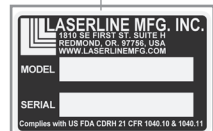
COMBO HAZARD-CLASS III  
EXPLANATORY



NON-INTERLOCKED  
PROTECTIVE HOUSING



APERTURE  
(FRONT SIDE NOT SHOWN)



IDENTIFICATION CERTIFICATION

## FCC DECLARATION

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. this device may not cause any harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The antenna connector is designed to fit the supplied antenna. Do not modify the antenna or connect any other type of antenna. If a replacement antenna is required, contact your dealer for an authorized antenna.

Any changes or modifications not expressly approved by the party responsible for compliance could cause the module to cease to comply with Part 15 of the FCC Rules, and thus void the user's authority to operate the equipment.

A label is affixed to the outside of the LineLokr that reads:

Contains Transmitter Module  
FCC ID: ZNS40105  
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## WARRANTY

This product is guaranteed against defects in materials and workmanship for both parts and labor, under normal working conditions for one year from the date of purchase, except as noted herein. LaserLine Mfg., Inc. liability under this warranty is limited to repairing or replacing any product returned to an authorized service center for that purpose. Any evidence of attempts to repair this unit by other than factory authorized personnel automatically voids the warranty. LaserLine does not take liability for any damages caused by non-accuracy of this product. Before using the product always check for accuracy per the enclosed instructions in this manual

Warning! Under no circumstances, attempt to open or disassemble Laser Housing.

Doing so may cause exposure to potentially hazardous levels of laser radiation.

### Factory Service Center

LaserLine MFG., INC.

1810 S.E. First Street, Suite H

Redmond, OR 97756

**Factory Service:** New Product Warranty service policy for four products stated above.

**For all Warranty:** Call Order Processing for RMA # at 541-548-0882. The Unit will be repaired and returned by prepaid freight.

### Non-Warranty

Send to: LaserLine MFG., INC. at above address

**Service Warranty:** 1 year on replacement Parts, 90 days on Labor.

## QUAD 4000 SPECIFICATIONS

|   |  |
|---|--|
| <b>Self Leveling</b>                    | Electronic servo temperature compensation<br>± 3° leveling range       |
| <b>Horizontal Accuracy</b>              | ± 10 arc seconds<br>± 1/16 per 100 feet<br>(± 1.5mm/30M)               |
| <b>Baseline accuracy using LineLokr</b> | To 1/16 (1.5mm) at up to 600 feet (183M)<br>(Depending on conditions)  |
| <b>Square Accuracy</b>                  | ± 10 arc seconds<br>± 1/16 per 100 feet<br>(± 1.5mm/30M)               |
| <b>Vertical (Plumb) Accuracy</b>        | ± 15 arc seconds<br>± 3/32 per 100 vertical feet<br>(± 2.25mm/30M)     |
| <b>Laser Range with Detector</b>        | 1,500 Feet/457M Radius<br>(Dependent on conditions and laser detector) |
| <b>LineLokr™ Range</b>                  | 600 feet/183M<br>(Dependent on conditions)                             |

|                                 |  |
|---------------------------------|--|
| <b>Battery Life (Quad 4000)</b> | 50 hours Standard Alkaline                     |
| <b>Battery Life (LineLokr™)</b> | 70 hours Standard Alkaline                     |
| <b>Quad 4000 Weight</b>         | 10.5 lbs./4.76k                                |
| <b>Quad 4000 Mount</b>          | 5/8 x 11 Standard Tripod                       |
| <b>Operating Temperature</b>    | 0° to +120°F (-18° to +50°C)                   |
| <b>Storage Temperature</b>      | -4° to +158°F (-20° to +70°C)                  |
| <b>Quad 4000 Rotation Speed</b> | 300 RPM  |
| <b>Laser Type/Class</b>         | 635nm Red Diode/Class 2                        |
| <b>Number of Beams</b>          | 3 Rotating, 1 Static                           |
| <b>Beam Diameter</b>            | Rotating, .60" (1.52cm)/Static, .050" (1.27mm) |

**LASERLINE MFG., INC.**  
Highest Quality - Most Versatile

1810 SE First Street, Suite H  
Redmond, OR 97756  
Phone 541 548 0882  
www.LaserLineMfg.com

**LASER LIGHT**  
DO NOT STARE INTO BEAM  
CLASS 2 LASER PRODUCT  
635nm, 1mW CW & 3.1uJ@5Hz