



**Electronic Self-Leveling Dual Grade
Horizontal Rotary Laser
Model No. 40-6584**



Instruction Manual

Congratulations on your choice of this Electronic Self-Leveling Dual Grade Horizontal Rotary Laser. We suggest you read this instruction manual thoroughly before using the instrument. Save this instruction manual for future use.

This is a Class IIIa laser tool and is manufactured to comply with CFR 21, parts 1040.10 and 1040.11 as well as international safety rule IEC 285.

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1. Kit Contents

Description Model No. 40-6584

Description	Qty.
Electronic Self-Leveling Dual Grade Horizontal Rotary Laser	1
Li-ion Rechargeable Battery Pack	1
Battery Adapter	1
Remote Control with 2 AA Batteries	1
Detector with 9V Battery and Clamp	1
Alkaline Battery Compartment (batteries not included)	1
Sighting Scope	1
Slope Plate	1
Fine Adjusting Plate	1
Instruction Manual with Warranty Card	1
Hard-Shell Carrying Case	1

2. Features and Functions

- Large $\pm 8^\circ$ electronic auto-level range. When beyond the leveling range, the laser beam will flash, rotation of the beam will stop, and an audible alarm will activate.
- Electronic beam shield to turn the laser beam off in one to three quadrants, when multiple lasers are being used.
- Programmable dual slope operation function allows user to perform slope at different inclinations in both x and y axis.
- Height of Instrument/Tilt alarm function ensures product accuracy.
- Dust and rain resistant.
- Operates with remote control.
- LCD display with backlight illumination.
- Adjustable rotation speeds of 600 and 1100 rpms.



3. Safety Instructions

Please read and understand all of the following instructions, prior to using this tool. Failure to do so, may void the warranty.

DANGER!

Class IIIa Laser Product
Max. Power Output: $\leq 5\text{mW}$
Wavelength: 625-645nm

**THIS TOOL EMITS LASER RADIATION.
DO NOT STARE INTO BEAM.
AVOID DIRECT EYE EXPOSURE.**



ATTENTION



IMPORTANT

- Read all instructions prior to operating this laser tool. Do not remove any labels from tool.
- Do not stare directly at the laser beam.
- Do not project the laser beam directly into the eyes of others.
- Do not set up laser tool at eye level or operate the tool near a reflective surface as the laser beam could be projected into your eyes or into the eyes of others.
- Do not place the laser tool in a manner that may cause someone to unintentionally look into the laser beam. Serious eye injury may result.
- Do not operate the tool in explosive environments, i.e. in the presence of gases or flammable liquids.
- Keep the laser tool out of the reach of children and other untrained persons.
- Do not attempt to view the laser beam through optical tools such as telescopes as serious eye injury may result.
- Always turn the laser tool off when not in use or left unattended for a period of time.
- Remove the batteries when storing the tool for an extended time (more than 3 months) to avoid damage to the tool should the batteries deteriorate.
- Do not attempt to repair or disassemble the laser tool. If unqualified persons attempt to repair this tool, warranty will be void.
- Use only original Johnson® parts and accessories purchased from your Johnson® authorized dealer. Use of non-Johnson® parts and accessories will void warranty.



4. Location/Content of Warning Labels





5. Location of Part/Components





6. Operating Instructions

IMPORTANT: It is the responsibility of the user to verify the calibration of the instrument before each use.

Alkaline Battery Installation:

Put 3 “D” alkaline batteries (not included) into the battery pack according to the polarity direction, then insert the battery pack into the laser. (Note: Batteries facing up.)



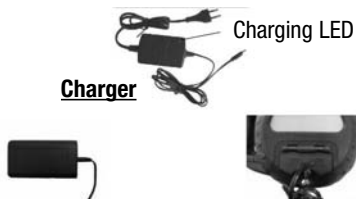
Rechargeable Battery Pack Installation:

Install the rechargeable battery pack into the laser.



Charging the Rechargeable Battery Pack:

Charge the rechargeable battery pack by inserting the charger into the charging port. The LED on the charger is red during the charging process; the LED on the charger will turn green when the battery is fully charged.



Charge the rechargeable battery pack outside the laser

Charge the rechargeable battery pack with battery pack inside the laser



Note:

- (1) Charge the rechargeable battery when the battery power is low (battery symbol on the LCD is flashing). This will extend the battery life.
- (2) If the laser is not going to be used for a long period of time, charge the rechargeable battery every 2-3 months.
- (3) The instrument can operate while the batteries are recharging.

Use of the Slope Plate and Fine Adjusting Plate:

If the laser is operating with less than +12% grade in the Y-axis, the slope plate is not required.



If the laser is operating between +12% and +25% in the Y-axis, the slope plate is required.

Slope Plate

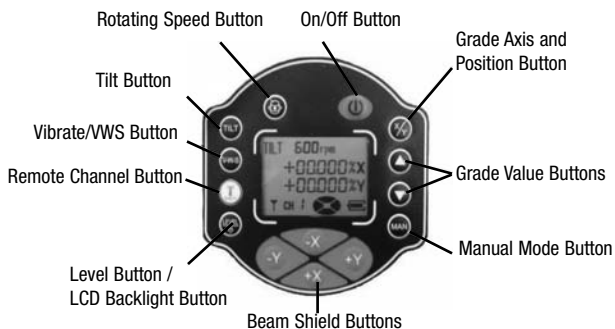
For exact positioning of the X or Y-axis, screw the Fine Adjusting Plate on the tripod and then screw the laser to the Fine Adjusting Plate. Use the sighting scope to rotate the laser to the exact position required. Use the Fine Adjustment Knobs for fine movement. Use the Lock Knob when positioned in the correct position.

Fine Adjusting
Plate

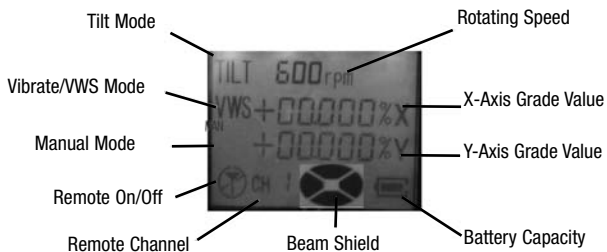


7. Using the Product

Keypad Controls



LCD Display




Power On/Off Button:


Press this button to power on/off the laser.



The laser is in self-leveling status when powered on.

Default rotate speed is 600 RPM

Default beam shield is off in all four quadrants;

Default grade for X-axis and Y-axis is 0.

The remote channel will display CH1.



If there is a matched remote control with the power on, the remote status will display  if there is not a matched remote, it will display .

When powered on, the laser will automatically check the battery capacity.

When powering on the laser it will enter into the self-leveling mode.

The TILT display will blink for thirty seconds after the lasers starts to rotate. During these thirty seconds, if the laser is moved it will stop rotating and re-level itself. After thirty seconds, the laser will enter into the TILT mode and the LCD will show a solid TILT display. (See TILT button)

Grade axis and Grade Value Button:


With the laser on, press the Grade Axis and Position button and hold in for two seconds. The laser will beep once and the laser will enter the X-axis grade setting mode. The X-axis symbol “X” and axis direction symbol (+) will flash. A short press of the button will move the position to the next symbol. Pressing the grade value buttons   will change the values. When the X-axis setting is





completed, press the grade axis button for two seconds to enter into the Y-axis grade setting mode. The Y-axis symbol “Y” and axis direction symbol (+) will flash. The setting method is the same as the X-axis.

After the Y-axis grade setting is completed, press this key for two seconds to confirm the grade setting. The laser will beep once and will quit the grade setting mode and start to work under the confirmed grade.

Note: If there is no buttons pressed for eight seconds in the grade setting mode, the laser will confirm the current grade setting data automatically. The laser will beep once and leave the grade setting mode.



Rotating Speed Button:

Press this button to select the rotating speed from 600 RPM to 1100 RPM.



Beam Shield Buttons:

When turning on the laser, the beam shield will be off in all four quadrants. All four quadrants on the LCD will be displayed. Pushing one of the buttons will turn the beam off in that quadrant and that quadrant will not be displayed on the LCD.

Note: One, two or three quadrants can be turned off simultaneously.



**TILT Button:**

When turning on the laser, the laser will self-level and begin to rotate. The TILT symbol on the LCD will blink for thirty seconds after the laser begins to rotate. During these thirty seconds, if the laser is moved the laser will stop rotating, re-level and begin to rotate again. After thirty seconds the TILT symbol will stop blinking and become solid. If the laser is moved when the TILT symbol is solid, the laser will stop rotating. The laser beam will blink on and off and the TILT symbol will blink quickly alerting the user that the height of instrument may have been changed. Pressing the level button will allow the laser to re-level and start rotating again and the TILT mode will repeat.

**Vibrate VWS Button:**

When pushing this button once, the VWS symbol will be displayed on the LCD. Note: If the TILT mode display is turned off, pushing the VWS button will turn the TILT mode display on. In this mode, the laser will not react to slight vibration near the laser. To turn the VWS mode display off, push the button one more time.

**MAN Button:**

When holding this button in for three seconds, the laser will enter into manual mode. The self-leveling motors are turned off and the laser will rotate in any position. Note: Grade value cannot be entered when in manual mode. To exit manual mode, hold the button in again for three seconds or push the TILT button to enter TILT mode.

**Level Button/LCD Backlight Button:**

Push this button once to start self-leveling after the laser has been moved in TILT mode. Hold this button in for three seconds to turn on the LCD backlight.

Remote Channel Button:

Push this button to switch the remote channel from CH1 to CHF.

Battery Status Indicator :

When powered on, the laser will automatically check the battery capacity and show the following status.



Full battery



Half battery



Low battery



Very low battery and laser should be charged




Empty battery and laser needs to be charged








Using the Remote Control:

1. Install two “AA” batteries in the battery compartment following the diagram inside the compartment.
2. With the laser turned on, turn on the remote by pressing the  power button.
3. The LCD on the remote will display the following









4. The laser and remote default into channel (CH1) 1. The remote control will only work when the laser and remote are on the same channel. If other lasers are in the area, the remote and laser can be changed from CH1 to CH9 and CHA to CHF making it so the remote will only work for a specific laser. To change the remote channel, press the  remote button.
5. If the LCD on the laser displays  the remote is not turned on, is too far away from the laser or is on a different channel.
6. If the LCD displays  on the laser and remote, the remote and laser are on the same channel.





Note: The battery symbol display on the remote shows the battery strength of the remote batteries and not the laser battery strength. The differences between the remote button and laser buttons are as follows:

1. Holding the  on the remote Level/Backlight for three seconds will turn on the remote backlight. To turn off the backlight, hold the same button in again for another three seconds.
2. One press of the  manual button will put the laser in “sleep” mode. All the laser settings will be saved on the laser. The only button that will work on the laser is the  power button. The only buttons that will work on the remote is the  manual button and  power button. Another press of the  manual button will turn the laser back on to its original setting. This “sleep” mode can be used to save on the battery life if the laser is not going to be used for a period of time.

If the laser is not used after sixty minutes in “sleep” mode, the laser will power off automatically and all stored information will be lost.





Detector Usage

Two-Sided Laser Detector with Clamp Model No. 40-6715

The 40-6715 laser detector is an indispensable accessory when using rotary laser levels. The main function of the detector is to detect the position of the laser signals that are transmitted by rotary lasers. This detection quickly and precisely provides the user with the horizontal reference.

This product features high sensitivity, a double-faced display, low power consumption, good reliability and easy manipulation. It can be used with most types of rotating laser levels.

1. Technical Specifications

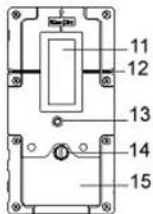
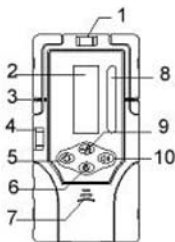
Detecting accuracy:	Fine: $\pm 0.039''$ ($\pm 1\text{mm}$) Coarse 1: $\pm 0.098''$ ($\pm 2.5\text{mm}$) when range ≥ 492 ft. (150m) Coarse 2: $\pm 0.394''$ ($\pm 10\text{mm}$) when range ≥ 492 ft. (150m)
Automatic Shut-off:	6 minutes ± 1 minute
Power Supply:	9V battery, 30 hrs continuous use (with LCD illumination off)
Sound indicator:	slow short beep, rapid short beep and continuous sound
LED display:	down arrow, up arrow, horizontal on grade bar
Dimensions:	6.30" x 3.35" x 1.10" (160 x 85 x 28mm)
Weight:	1 lb. (0.45kg)
Others:	Rain and dust resistant





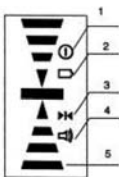
2. Components

(a) Exterior Instruction



- 1) Horizontal vial
- 2) Front display window
- 3) Front on grade mark
- 4) Vertical vial
- 5) LED key
- 6) Power key
- 7) Beeper
- 8) Reception window
- 9) Fine/Coarse accuracy key
- 10) Beeper key
- 11) Back display window
- 12) Back on grade mark
- 13) Bracket screw thread
- 14) Battery cover screw
- 15) Battery cover

(b) Display



1. Power on symbol
2. Low battery indicator
3. Fine/Coarse symbol
4. Beeper symbol
5. Position indication arrows



Power Key: Turn on/off the power



Fine/Coarse Accuracy Key: Switch detecting accuracy



LED Key: Turn on/off the LCD's light



Volume Key: Cycles between high, low and off





3. Operation Guide

(a) Battery Installation

- Open the battery cover door by turning the battery cover screw counter-clockwise. Put the battery into the battery case noting the polarity shown in the battery compartment.
- Put the battery cover door back, and tighten the screw.



Figure 1

- Note:**
- 1) Remove the battery when the unit is being stored for a long time.
 - 2) When the low battery indicator is displayed, change the battery soon.

4. Operating Instructions

Power On

Press the power key to turn the unit on. The LCD display will illuminate all the indicator segments for 0.5 second (Fig.2). When the indicator segments are no longer illuminated, the detector is ready for use.

Note: The LCD display will still have the power, detection and sound indicators illuminated (Fig. 3).



Figure 2

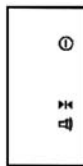


Figure 3





Fine/Coarse accuracy key

Power on and press the fine/coarse accuracy key, the unit will cycle between three accuracy options: fine, coarse 1, coarse 2. The accuracy symbol displayed on the LCD will change.



Fine



Coarse 1



Coarse 2

Volume Key

Power on and press the volume key, the unit will cycle between a high sound, low sound and mute.



High sound



Low sound



Mute

The sound symbol displayed on the LCD will change accordingly.

Note: There will be two beeps when turning the unit on and off. There will be one beep when changing functions.

Detecting Laser Level Signals

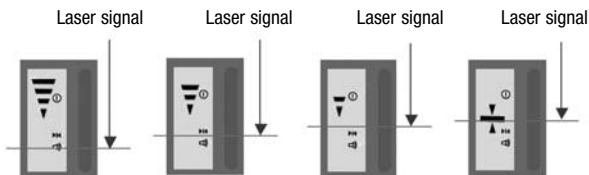
While detecting laser signals, the LCD will display as follows: (take the set-up state of high sound and fine detection as an example)



<p>Laser signal</p>	<p>Laser signal</p>	<p>Laser signal</p>	
The laser signal is down	The laser signal is up	Horizontal bar indicated on-grade	No laser signal is detected
Sound: rapid short beeps	Sound: slow short beeps	Sound: continuous sound	Sound: no sound





When the laser signal is near the on-grade mark, the displayed up and down arrows will decrease as the distance to the on-grade mark decreases.



1. When detecting a horizontal laser signal, it is important to have the bubble vial centered, as the deflection of the receiver will influence its receiving accuracy. 
2. When detecting a vertical laser signal, it is important to have the bubble vial centered, as the deflection of the receiver will influence its receiving accuracy. 
3. Keep the reception window facing the laser while detecting.
4. Hold the unit stable while detecting.

LED Function

Power on and press the LED key, the LCD will now be backlit.

Automatic Shut-off Function

When the unit does not receive a laser signal for 6 minutes, the unit will power off automatically.

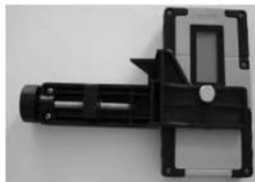
Low Battery Display Function

When the battery sign blinks on the LCD, the battery is low and needs to be replaced. If the battery is very low, the unit will power off automatically. Replace the battery.



Rod Clamp

Connecting to the rod clamp.



Connecting to the grade rod.



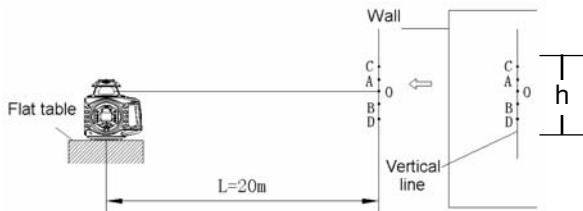
5. Detector Maintenance

- Keep the unit, particularly the reception window, clean. If it does get dirty, use a cloth to wipe it clean.



8. Self-Check & Fine Calibration

IMPORTANT: It is the responsibility of the user to verify the calibration of the instrument before each use.



The instrument must be self-checked for accuracy periodically, specifically before a large project, where accuracy is critical. If the accuracy is found to be beyond tolerance, some adjustment may be made as follows.

X-Axis and Y-Axis Accuracy Check:

1. Place a table indoors, approximately 20m from a wall. Place the instrument on the table with the X-axis facing the wall.
2. Power the instrument on and allow it to self-level. Adjust the rotating speed to make the output laser line clear and visible. Mark a vertical line on the wall that intersects the laser line from the instrument. Mark a line where the laser line hits the vertical line, and label as 'A'.





(Turning in a clockwise direction):

A = X+








B = Y+

C = X-

D = Y-


3. Rotate the instrument 90°, and after self-level completes, mark a line and label as 'B'. Repeat two more times, labeling lines as 'C', and 'D'.
4. Measure the vertical distance 'h' between the highest and the lowest points among A, B, C, and D.
5. If $h=2\text{mm}$ or less, accuracy is qualified. If $h>2\text{mm}$ but $<10\text{mm}$, adjust the calibration. If $h>10\text{mm}$, please contact an authorized service center or dealer for repair.

Accuracy Calibration of the X and Y-Axis:

1. Power off the instrument and face the X-axis to the wall.
2. Press  and  simultaneously, and then release  while still pressing  for approximately ten seconds. The instrument will then enter Calibration mode, and 'CAL' will be displayed.
3. Using the Remote Control, press the  button to select the axis to be calibrated.
4. On the remote, press the   buttons to move the laser line up and/or down, until the laser line hits directly on reference point '0'.



**Calibration Confirm:**

Press the  button to confirm the calibration value after calibration is completed. Instrument will return to normal operation mode.

Note: In the self-check and calibration mode, self-calibration coefficient is from 1600-2495. If user calibrates in this range, and accuracy is still not achievable, please contact an Authorized Service Center or Dealer for repair.

- After Calibration is complete, user must turn the instrument off and then back on. Calibration is then complete.
- When calibrating, the user must check accuracy of both the X and Y Axis, until both are within accuracy specification.





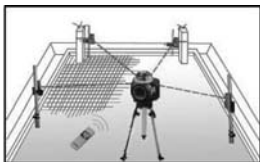
9. Technical Specifications

Laser Wavelength	635nm±10nm
Laser Classification	Class IIIa
Maximum Power Output	≤5mW
Accuracy	±1/16"/100 ft. (±1.5mm/30m)
Interior Range	Up to 200 ft. (60m) diameter depending on light conditions
Exterior Range	Up to 2000 ft. (600m) diameter
Remote Range	Up to 200 ft. (60m) diameter
Auto-Leveling Range	±8°
Grade Setting	X Axis -10% – +10% Y Axis -1% – +25% X + Y = 20%
Scan Speed	600 and 1100 rpm
Power Supply	Li-ion Rechargeable Battery Pack or adapter (included); 3 "D" Alkaline batteries (not included)
Battery Life	Approx. 40 hours with Li-ion Rechargeable Battery Pack (included)
Dimensions	9.252" x 7.086" x 9.763" (235 x 180 x 248mm)
Weight	7.275 lbs. (3.3Kg)
Working Temperature	14°F to 113°F (-10°C to 45°C)
Center Screw Thread	5/8" – 11
IP Protection Class	66

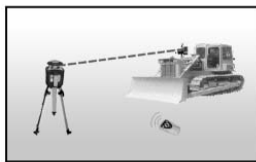




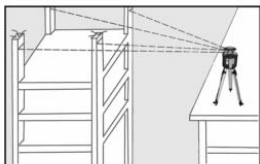
10. Application Demonstrations



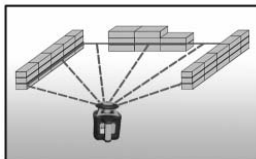
Squaring Leveling



Grading



Elevation



Set Forms





11. Care and Handling

- This laser unit is a precision tool that must be handled with care.
- Avoid exposing unit to shock vibrations and extreme temperatures.
- Before moving or transporting the unit, make sure that the unit is turned off.
- Remove the batteries when storing the unit for an extended time (more than three months) to avoid damage to the unit should the batteries deteriorate.
- Always store the unit in its case when not in use.
- Avoid getting the unit wet.
- Keep the laser unit dry and clean, especially the laser output window.
Remove any moisture or dirt with a soft, dry cloth.
- Do not use harsh chemicals, strong detergents or cleaning solvents to clean the laser unit.

12. Product Warranty

Johnson Level & Tool offers a three year limited warranty on each of its products. You can obtain a copy of the limited warranty for a Johnson Level & Tool product by contacting Johnson Level & Tool's Customer Service Department, as provided below, or by visiting our web site at www.johnsonlevel.com. The limited warranty for each product contains various limitations and exclusions.

Do not return this product to the store/retailer or place of purchase.

Non-warranty repairs and course calibration must be done by an authorized Johnson® service center or Johnson Level & Tool's limited warranty, if applicable, will be void and there will be NO WARRANTY. Contact one of our service centers for all non-warranty repairs. A list of service centers can be found on our web site at www.johnsonlevel.com or by calling our Customer Service Department. Contact our Customer Service Department for Return Material Authorization (RMA) for warranty repairs (manufacturing defects only). Proof of purchase is required.





NOTE: The user is responsible for the proper use and care of the product. It is the responsibility of the user to verify the calibration of the instrument before each use.

For further assistance, or if you experience problems with this product that are not addressed in this instruction manual, please contact our Customer Service Dept.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.

13. Warranty Registration

Enclosed with this instruction manual you will find a warranty registration card to be completed for your product. You will need to locate the serial number for your product that is located on the bottom of the unit. **PLEASE NOTE THAT IN ADDITION TO ANY OTHER LIMITATIONS OR CONDITIONS OF JOHNSON LEVEL & TOOL'S LIMITED WARRANTY, JOHNSON LEVEL & TOOL MUST HAVE RECEIVED YOUR PROPERLY COMPLETED WARRANTY CARD AND PROOF OF PURCHASE WITHIN 30 DAYS OF YOUR PURCHASE OF THE PRODUCT OR ANY LIMITED WARRANTY THAT MAY APPLY SHALL NOT APPLY AND THERE SHALL BE NO WARRANTY.**





14. Accessories

Johnson® accessories are available for purchase through authorized Johnson® dealers. Use of non-Johnson® accessories will void any applicable limited warranty and there will be **NO WARRANTY**. If you need any assistance in locating any accessories, please contact our Customer Service Department.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.

