ROBOTOOLZ™

RT-7690-2

Self-leveling, remote-controlled, simultaneous level and plumb rotational laser system

User Guide

Toolz
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Contents

User Safety

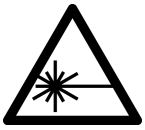
The RT-7690-2 self-leveling, simultaneous level and plumb rotational laser system is a Class IIIA laser product. Observe the following precautions when using this device:

- Always operate the unit according to the procedures in this user guide.
- Avoid direct eye exposure to the laser beam.
- Do not point the laser beam at another person's face.
- Turn off the power to the base unit before moving it, to avoid accidental laser exposure and to protect and lock the pendulum.
- Do not disassemble or attempt to service the unit (with the exception of calibration, as described in the instructions provided). Repairs or service are to be done only by an authorized service center.

Warning Labels

The following labels are attached to every RT-7690-2 unit. They should not be removed or defaced.

This Danger label is located on the front of the unit. It identifies the RT-7690-2 laser system as a device that emits laser radiation and requires appropriate user safety precautions.



This symbol is shown next to every laser aperture on the product. Laser radiation is emitted from both the level and plumb apertures.

FCC Statement

This product 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following 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.

IMPORTANT: Changes or modifications to this product not authorized by Toolz could void the FCC Certification and negate the user's right to operate the product.

Overview

The RT-7690-2 is a two-beam, self-leveling, remote-controlled laser system. Its level and plumb laser beams can be independently controlled from the base unit or RF remote control. A remote control with built-in laser detector allows for laser beam detection under lighting conditions where beam visibility is poor.

This guide describes the features and operation of the RT-7690-2 laser system. Important warranty and safety information is also included.

RT-7690-2 Features

The RT-7690-2 laser system includes the following features:

Base Unit

- Level and plumb laser beams, with independent and simultaneous operation
- Level and plumb self-leveling range: ±6 degrees
- Accuracy:
  – Level: ±1/8 in. (3 mm) at 100 ft. (30m)
  – Plumb: ±1/4 in. (6.4 mm) at 100 ft. (30m)
- Level and plumb Spin mode
  – Variable rotation speeds (350, 600, and 1200 rpm)
  – Plumb alignment: ±2.0 degrees
- Level and plumb Line Dither/Scan mode, for higher beam visibility
  – Six line lengths
  – 360° level and plumb positioning
- End-user calibration
- Pendulum lock mechanism, for protection during transport and storage
- Out-of-level indicator
- Automatic power standby, with override
- Low battery indicator
- Built-in tripod mount – 5/8" x 11", for standard surveyor's tripods, such as the RoboToolz RT-A1150

RF Remote Control/Laser Detector

- RF remote control range 300 ft. (90m)
- Laser beam functions controllable from the base unit or RF remote control
- Confirmation of last command sent
- Laser beam locator, with fine/coarse resolution selection
- Low battery indicator

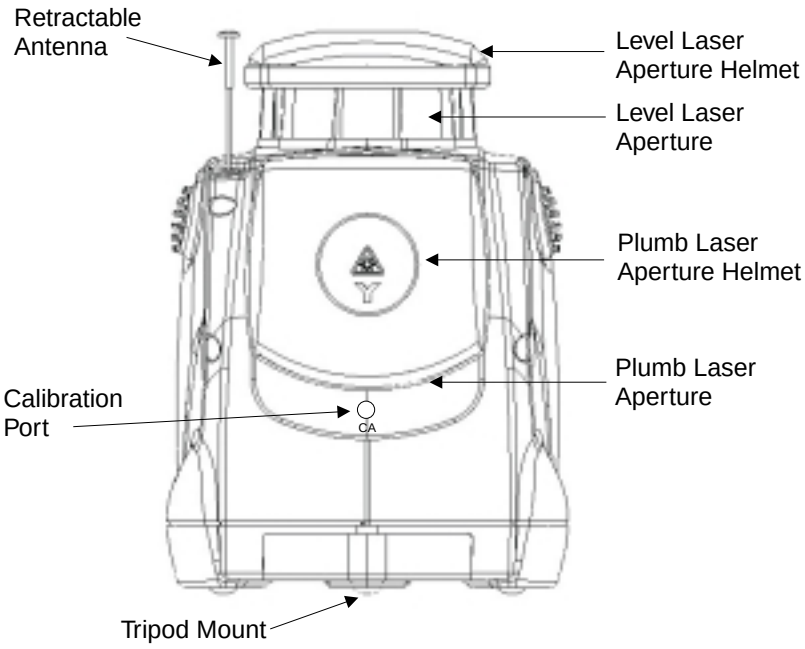
Accessories

- Rod bracket (for laser detector)
- AC/DC power adapter (for base unit)
- Laser enhancement glasses
- Laser target

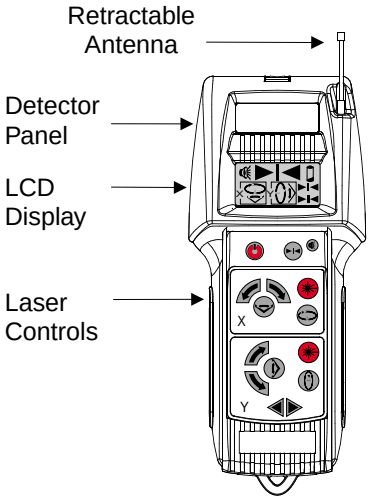
RT-7690-2 Components

The following illustrations show the main components of the RT-7960-2 laser system base unit and RF remote control/laser detector.

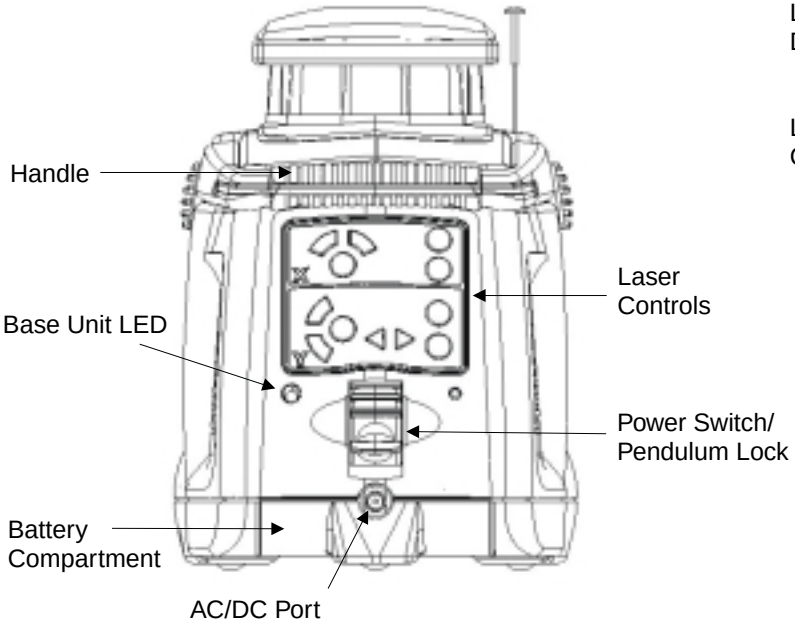
Base Unit (front)



RF Remote Control/ Laser Detector



Base Unit (back)



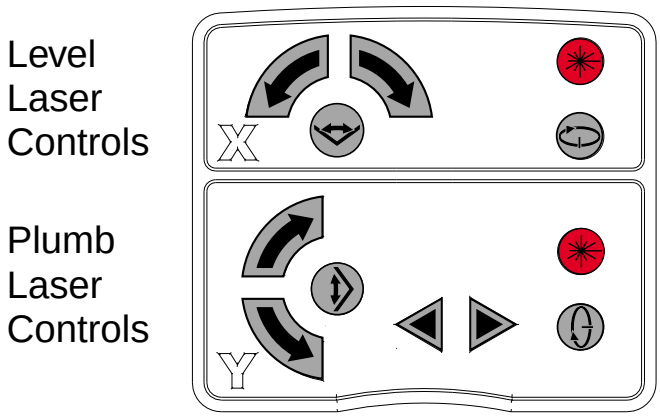
Operation

This section describes the operation of the RT-7690-2 base unit and its operating modes, and explains how to use the laser detector.

RT-7690-2 Controls

Laser control functions are available from both the base unit and RF remote control/laser detector. Refer to the following illustrations for the location of the operating controls.

RT-7690-2 Base Unit Controls



Level
Laser On/Off

Level
Spin Mode/
Speed Select

Level
Clockwise/
Counterclockwise
Line Dither/Scan
Position

Level
Line Dither/Scan
Mode

Plumb
Laser On/Off

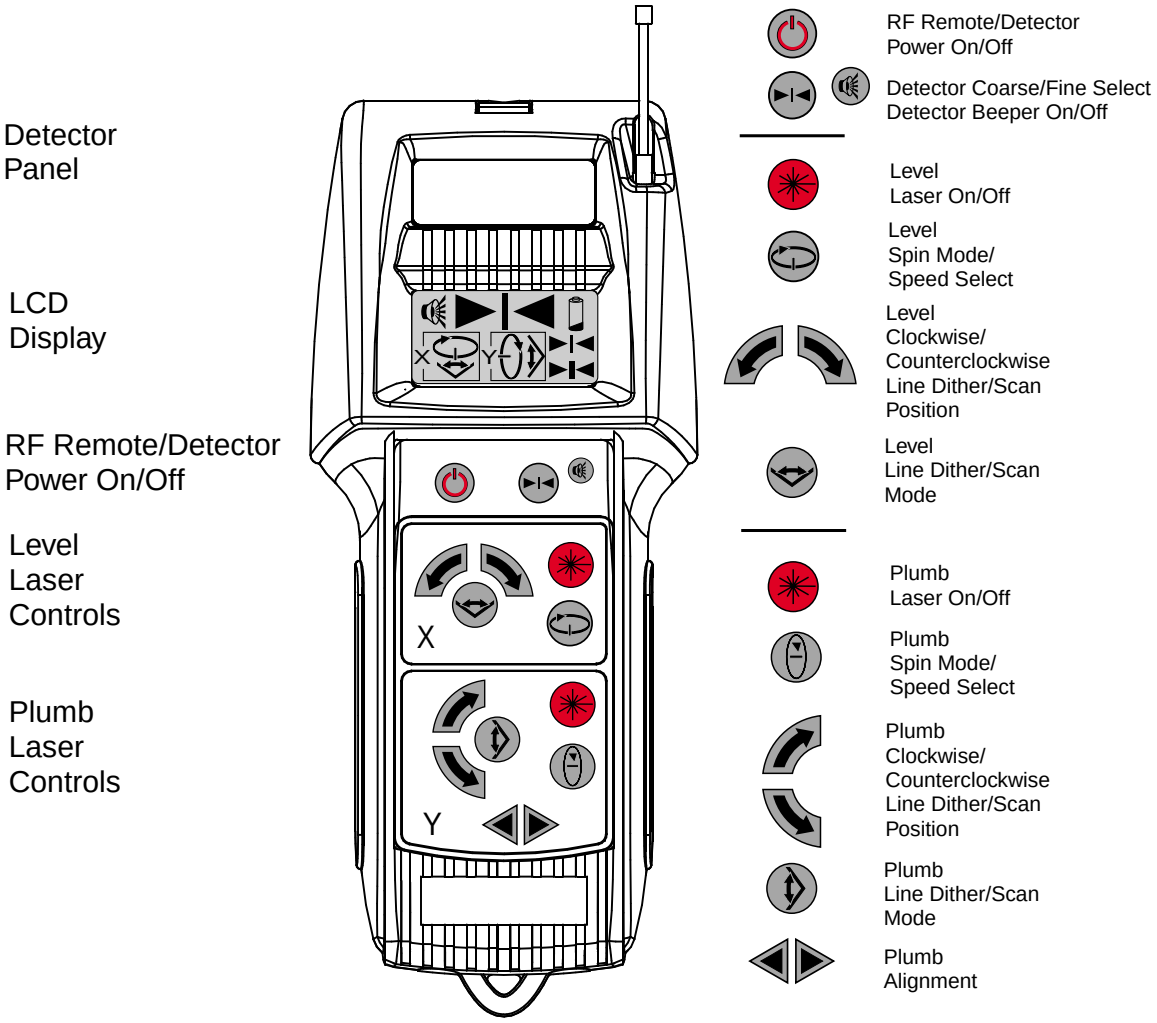
Plumb
Spin Mode/
Speed Select

Plumb
Clockwise/
Counterclockwise
Line Dither/Scan
Position

Plumb
Line Dither/Scan
Mode

Plumb Alignment

RT-7690-2 RF Remote Control/ Laser Detector Controls



✍ Note: The LCD display icons are described in the Laser Detector section.

Turning on the Laser System

1. Place the RT-7690-2 base unit on a relatively flat surface, or set it on a standard surveyor's tripod, using the built-in 5/8" x 11" tripod mount on the bottom of the unit.
2. Turn on the unit with the power switch on the base unit. This switch also unlocks the pendulum inside the unit so it can move freely, allowing the unit to self-level. The base unit LED should flash green for approximately five seconds, then turn to a steady green, indicating that the unit is on and functioning properly.

   ✍ Notes:

   1. Main power can be turned on only from the base unit.
   2. None of the control buttons on the base unit or RF remote control work until the LED on the base unit has stopped flashing and has turned to a steady green.
   3. Turn on the level or plumb laser from the base unit or RF remote control  .

❖ Caution: Both lasers and the main power switch should always be turned off before transporting or storing the base unit.

Using the Lasers

The RT-7690-2 laser system's level and plumb lasers operate independently. You can turn on the level laser, the plumb laser, or both lasers simultaneously.

- Use the level Spin or Line Dither/Scan laser for indoor and outdoor plumb and alignment applications, such as plumbing framing or aligning conduit.
- Use the plumb Spin or Line Dither/Scan laser for indoor and outdoor level applications such as leveling cabinetry, setting concrete forms, or leveling electrical outlets.
- Simultaneous operation of the level and plumb laser beams generates a crosshair for level and plumb alignment applications such as aligning cabinetry or tiling.

✍ Note: See the Applications section for application illustrations.

Operating Modes – Spin and Line/Dither Scan

The RT-7690-2 base unit has two basic operating modes:

- Spin mode – The laser beam is dispersed throughout the level or plumb plane. Spin mode is used under conditions where laser beam visibility is poor or nonexistent (for example, outdoors in daylight). Spin mode produces a less visible laser beam, which can be detected indoors or outdoors with the laser detector built into the RF remote control.
- Line Dither/Scan mode – The laser beam moves rapidly back and forth (dithers), producing a shorter, brighter beam than in Spin mode. With the brighter laser beam, the laser detector is not required. The length of the line dither can be set easily to the requirements of the level and plumb applications. Line Dither/Scan mode is normally used for indoor applications.

✍ Note: The RT-7690-2 base unit can be controlled by the laser controls on both the base unit and on the RF remote control. The RF remote control allows for non-directional, unobstructed operation of the base unit from up to 300 ft. (90m) anywhere on the job site.

Spin mode

When the laser is first turned on  , it is in Spin mode at the slowest speed. Continue pressing the level  or plumb  Spin button to cycle through the medium and fast speeds, then back to slow speed. Decrease speed to improve laser beam visibility, especially for indoor applications.

A plumb alignment  is available for the plumb laser in Spin mode, with a range of ±2.0° around the center of rotation. The default position is the midpoint of the 4° adjustment range. The base unit emits a constant beep is emitted if the adjustment limit is reached.

✍ Note: To enter Spin mode from Line Dither/Scan mode, press the level  or plumb  Spin button on the keypad.

Line Dither/Scan mode

When the laser is first turned on  , it is in Spin mode. To enter Line Dither/Scan mode, press the level  or plumb  Line Dither/Scan button on the keypad. A short, bright line appears. Continue pressing the Line Dither/Scan button to cycle through the six different line lengths, then back from the longest line to the shortest.

✍ Note: The laser beam is less visible at longer line lengths. It may be necessary to use the laser detector to accurately locate the beam.

A plumb alignment  is available for the plumb laser in Line Dither/Scan mode, with a range of ±2.0° around the center of rotation. The default position is the midpoint of the 4° adjustment range. The base unit emits a constant beep is emitted if the adjustment limit is reached.

The level  and plumb  Position buttons are used to move the line dither through a 360° range in either the level or plumb plane. Pressing and holding the button increases the speed of travel.

Out of Level

Out-of-level indicators alert the user if the base unit is not on a level surface or if it is out of self-leveling range. When the unit is out of level, the following occurs:

- The base unit LED flashes red once per second.

- The laser beam stops rotating (if in Spin mode) or dithering (if in Line Dither/Scan mode) and flashes a laser dot in sync with the base unit LED.
- The beeper on the base unit sounds in sync with the laser beam and base unit LED.

✍ Note: If the laser beam is not turned on, an out-of-level condition will still be indicated by flashing and beeps from the base unit.

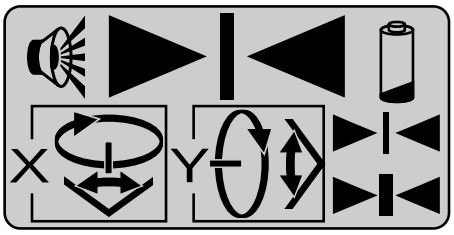
Reposition the unit to ensure that it is within the self-leveling range of ±6 degrees. Once the unit is within self-leveling range, the LED turns green and the laser beam stops flashing. The RT-7690-2 base unit resumes the mode of the last signal sent to the base unit.

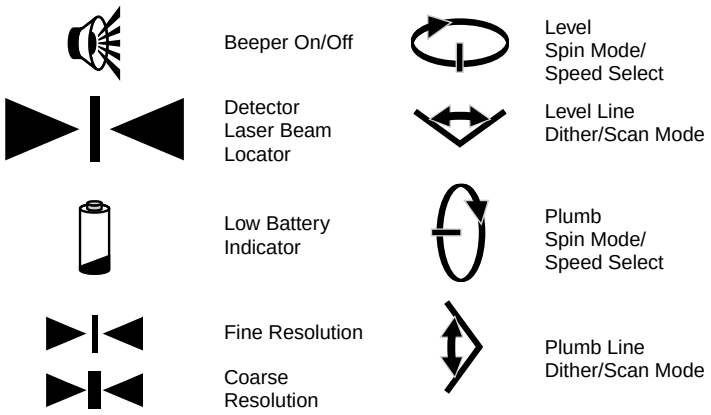
✍ Note: The out-of-level indicator overrides all other indicators. If the laser system is in low battery mode or in standby mode and the laser system becomes out of level, the out-of-level indicator will override the low battery indicator or standby mode indicator.

Laser Detector

The detector allows accurate detection of the laser beam outdoors, or under other conditions when the laser beam is difficult to see. The following diagram illustrates the detector LCD display icons.

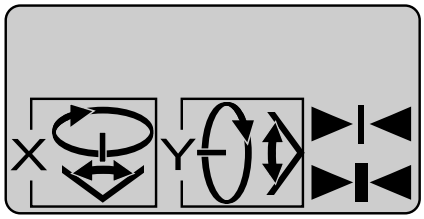
Detector LCD Display





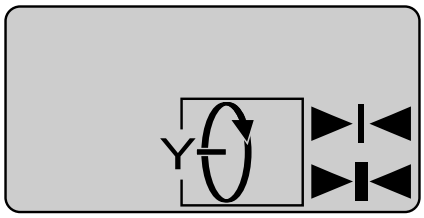
To use the detector:

1. Activate the RF Remote/Detector with the keypad RF Remote/Detector Power On/Off button . You will hear a single beep, and icons in the lower portion of the LCD will be displayed, showing all available options. This confirms that the unit is activated, but the lasers and detector have not been turned on. You can now turn on the lasers and the detector.

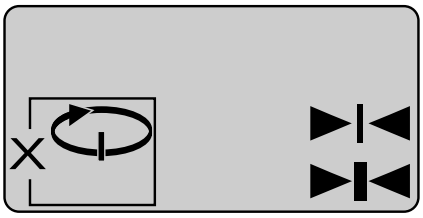


RF Remote/Detector activated

2. Turn on the level and/or plumb laser and make any other selections desired from the keypad. (See the Operating Modes section.). As soon as one or both of the lasers are turned on, icons displayed will confirm the laser (level, plumb, or both) and mode (Spin or Line Dither/Scan) selected. Both the level and plumb lasers start up in Spin mode, at the slowest speed.



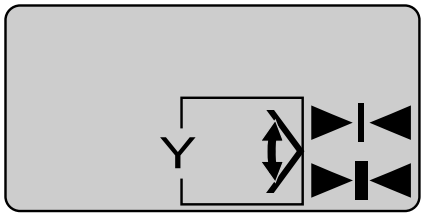
Plumb laser, Spin mode, Detector Off



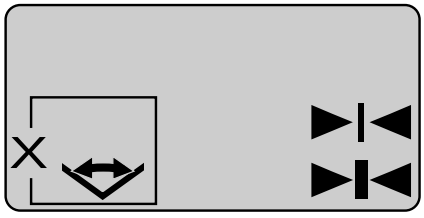
Level laser, Spin mode, Detector Off

✍ Note: The LCD display only shows the laser modes for commands transmitted to the laser tool from the RF remote control. Any commands made from the base unit controls will *not* be shown on the RF remote control/laser detector LCD.

Press the plumb or level Laser On/Off button again to switch to Line Dither/Scan mode.

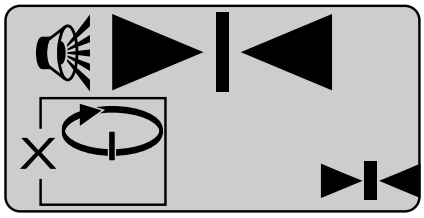


Plumb laser, Line Dither/Scan mode, Detector Off

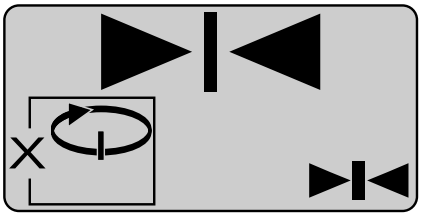


Level laser, Line Dither/Scan mode, Detector Off

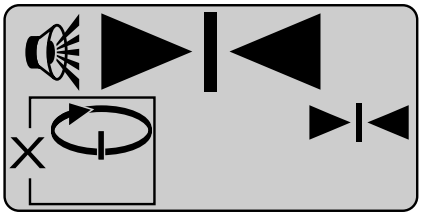
3. To turn on the detector, press the Coarse/Fine select button . On startup, the laser detector resolution is coarse, with the beeper on. The coarse resolution and beeper icons are displayed on the LCD. Continue pressing the Coarse/Fine button to cycle through the following options:



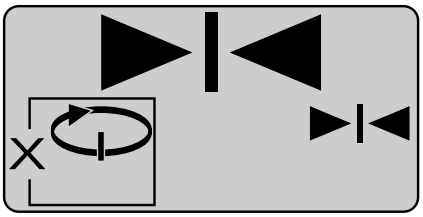
Beeper on, Detector on, Coarse resolution
Level Laser, Spin mode



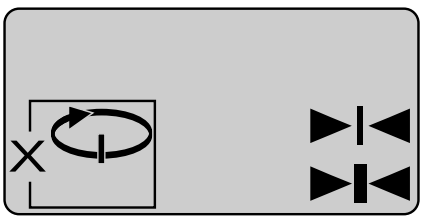
Beeper off, Detector on, Coarse resolution
Level Laser, Spin mode



Beeper on, Detector on, Fine resolution
Level Laser, Spin mode



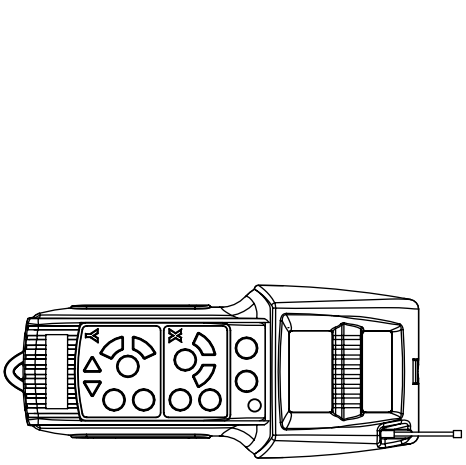
Beeper off, Detector on, Fine resolution
Level Laser, Spin mode



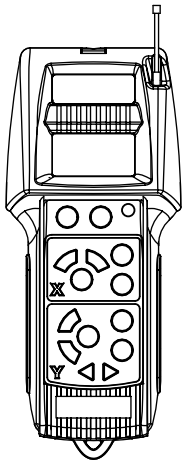
Detector power off
Level Laser, Spin mode

4. Locate the laser beam, using the red sensor panel on the RF remote control/laser detector. As the laser beam is approached, a single arrow points in the direction of the beam. Beeps from the base unit help the user locate the laser beam:
   - Rapid beeping means the detector is pointed too high or too far to the left or right.
   - A continuous tone indicates that is pointed directly toward the laser beam.
   - A slow beep means the detector is pointed too low, or off center in the opposite direction.
5. Center the beam by moving the detector in the direction of the arrow. When the beam is aligned with the center of the detector sensor panel, both arrows on the LCD display are lit and the beep is continuous, indicating that it is properly centered.

   ✍ Note: Detector orientation depends on whether the detector is being used to locate the level or plumb laser beam.



Level laser detection



Plumb laser detection

6. To turn off the RF remote control/laser detector, press the power on/off button. There is a double beep for confirmation, the LCD screen becomes blank, and the lasers are shut off.

Using the Reflective Target

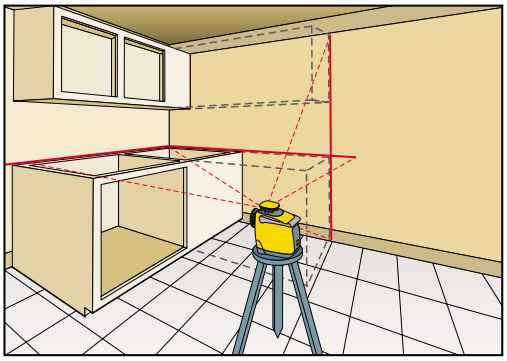
The red acrylic used in the targets enhances the laser, making the laser dot more visible.

Using the Laser Enhancement Glasses

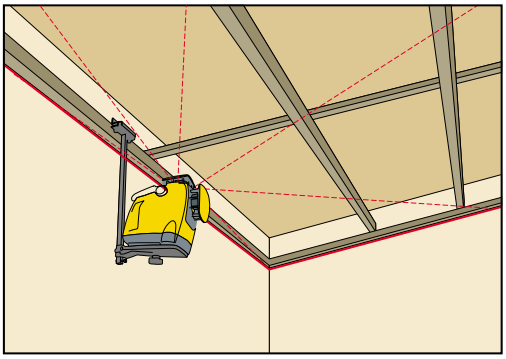
The red plastic used in the glasses enhances the laser, making the laser dot more visible. These glasses are particularly useful when using the RT-7690-2 laser system outdoors or in brightly-lit environments.

Applications

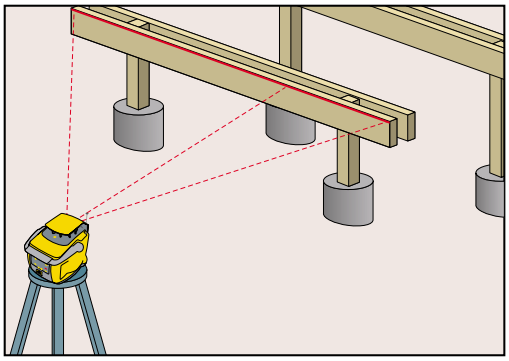
Level



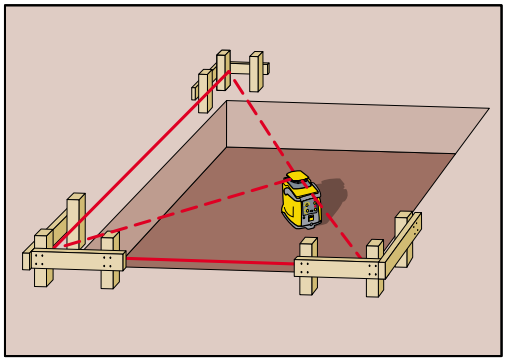
Level (Carpentry)



Level (Drop Ceiling)

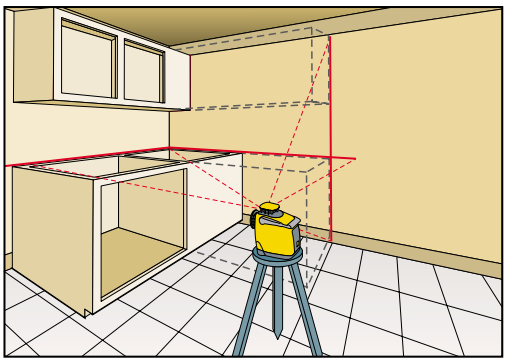


Level (Framing)

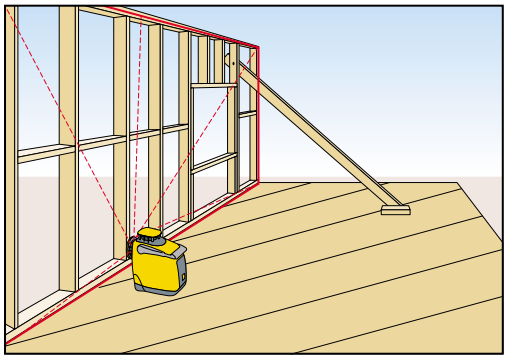


Level (Concrete)

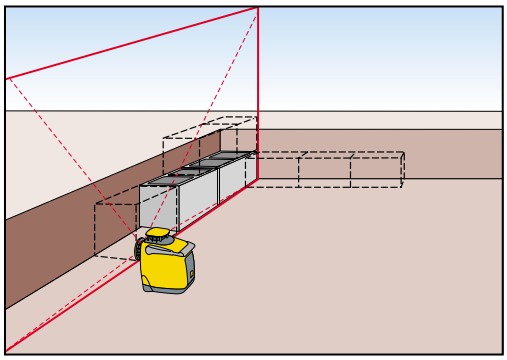
Plumb



Plumb (Carpentry)

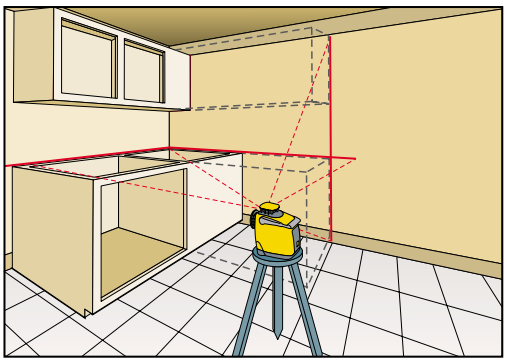


Plumb (Framing)

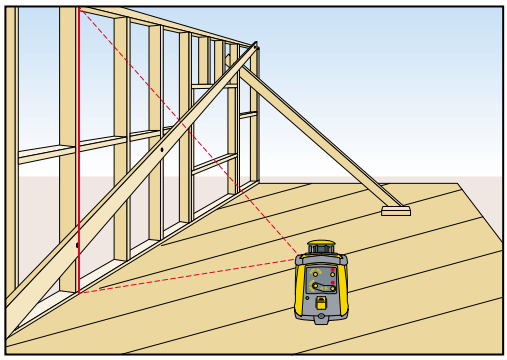


Plumb (Concrete)

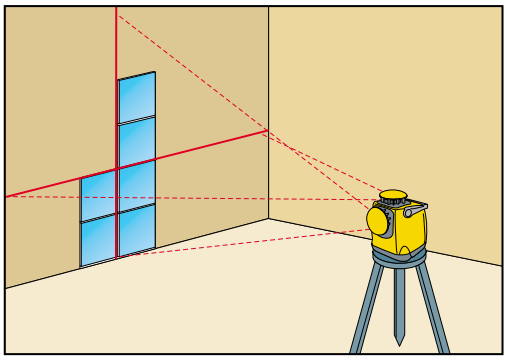
Align



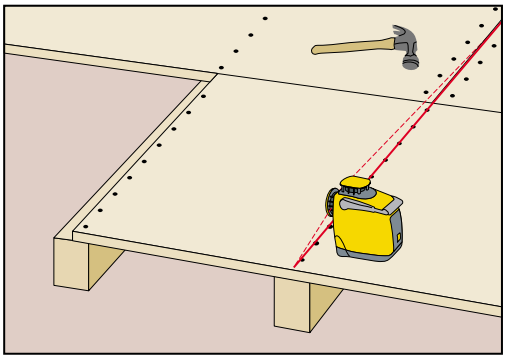
Align (Carpentry)



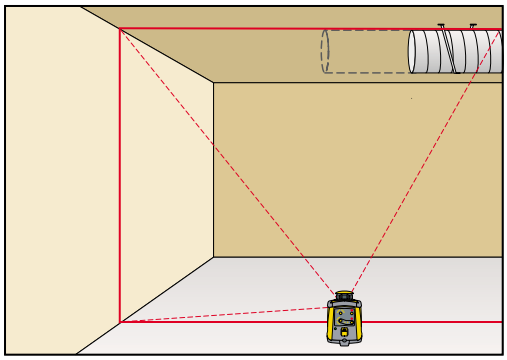
Align (Framing)



Align (Tiling)

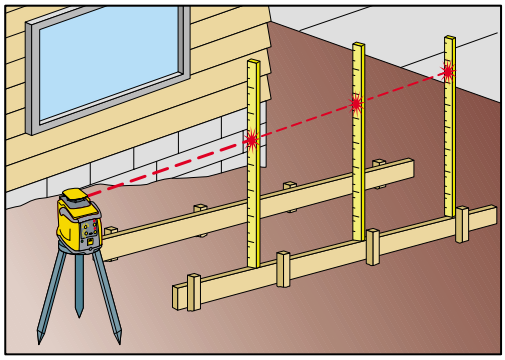


Align (Flooring)



Align (HVAC)

Grade



Grade (Concrete)

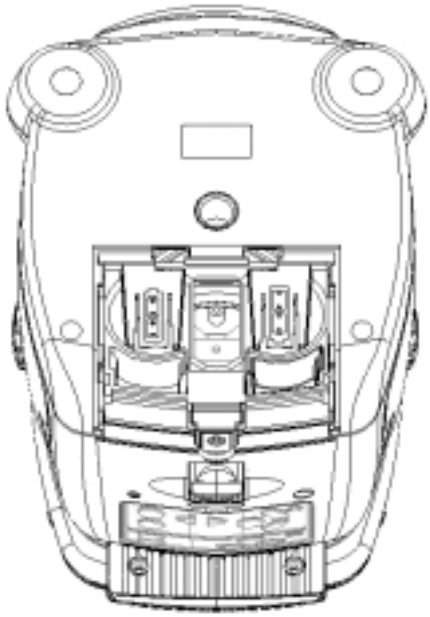
Power

Base Unit

The base unit can be powered by four “D” cell batteries (alkaline or non-alkaline) or by AC power through a power adapter. Batteries *cannot* be recharged in the unit.

Low battery indicator
Low battery power is indicated by the base unit LED flashing yellow when 25 percent of battery life remains (approximately five hours of use remaining). The LED flashes, and continues to flash in a pattern of three seconds on/one second off, until the batteries are replaced or fail.

Battery replacement
The base unit battery compartment is located at the back of the unit, below the power switch and AC/DC port. Open the compartment and replace the batteries, ensuring that the polarity is correct, as shown in the diagram.



❖ Caution: Remove all batteries from the RT-7690-2 base unit and RF remote control/laser detector whenever the units are being stored for an extended period of time.

Power Standby mode
When no commands have been received for 25 minutes, the RT-7690-2 base unit automatically enters Power Standby mode to save battery life. The base unit LED flashes green once per second to indicate Power Standby mode. The timer is reset each time the user sends a command to the base unit from the RF remote control or base unit, or if the laser detector is still in use.

- To override Power Standby mode, press and hold the base unit Laser On/Off button for three seconds. This overrides power standby for the base unit. The base unit emits a beep and two “chirps,” confirming that automatic power standby is disabled. After automatic power standby is disabled, the base unit will continue to operate for a maximum period of eight hours.

- To re-enable automatic power standby, press and hold the Laser On/Off button again for three seconds. The command is confirmed by another beep and one “chirp.”

When the base unit enters Power Standby mode, it “remembers” the settings that were in effect, and returns to these settings when a command is issued and power comes back on. Current settings are *not* retained when power is turned off with the base unit main power switch.

RF Remote Control/Laser Detector

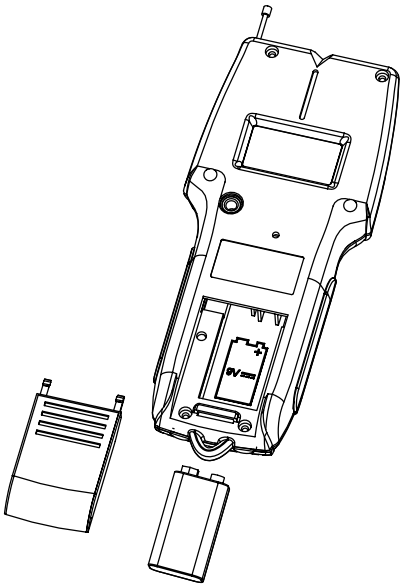
The RF remote control/laser detector is powered by a 9V battery (alkaline or non-alkaline).

Low battery indicator

When RF remote control/laser detector battery capacity falls below 25 percent, an icon on the detector LCD display indicates low battery power (approximately four hours of use remaining).

Battery replacement

The remote control/detector battery compartment is located at the back of the unit. Open the compartment and replace the 9V battery, ensuring that the polarity is correct, as shown in the diagram.



❖ Caution: Remove all batteries from the RT-7690-2 base unit and RF remote control/laser detector whenever the units are being stored for an extended period of time.

Power Standby mode

The RF remote control/laser detector enters Power Standby mode if none of the RF remote control buttons are pressed *or* if the detector is not used for 20 minutes. The RF remote control/laser detector timer is reset each time the user presses a button to operate the RF remote control or the detector is used.

- To override Power Standby mode, press and hold the Laser On/Off button on the RF remote control/laser detector for three seconds. This overrides automatic power standby for the RF remote control/laser detector. The RF remote control/laser detector emits a beep and two “chirps,” confirming that automatic power standby is disabled. After automatic power

standby is disabled, the RF remote control will continue to operate for a maximum period of eight hours.

- To re-enable automatic power standby, press and hold the Laser On/Off button  again for three seconds. The command is confirmed by a beep and one “chirp.”

Temperature Protection

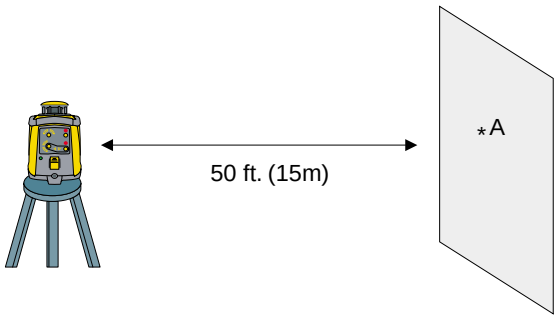
The laser beam automatically shuts off when the temperature of the unit reaches 113°F (45°C). The laser comes back on once the unit cools below 104°F (40°C). Current operating settings are retained, and the RT-7690-2 base unit returns to the last functional mode selected.

Calibration

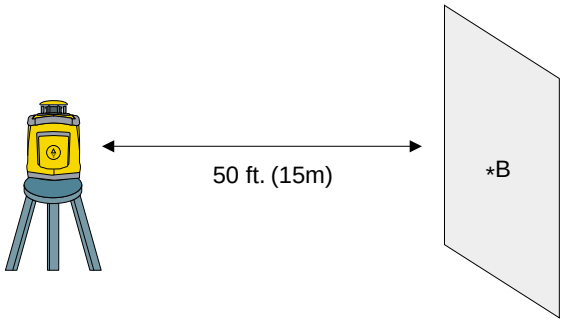
The RT-7690-2 laser system is calibrated before shipment to ensure that you receive a superior product conforming to the product specifications listed. Although it has been calibrated before leaving the factory, it contains many precision-machined parts that may be affected if the instrument is subject to abuse. Therefore, if the unit is ever dropped or sustains significant impact, the user should check calibration. We also recommend that you calibrate your tool periodically as a normal maintenance procedure.

To calibrate the RT-7690-2 laser system:

1. Select a site to be used as a calibration range that will allow the base unit to be placed about 50 ft. (15m) away from a smooth vertical surface such as a wall. Use a flathead screwdriver to remove the calibration port covers on the side and front of the unit. Store the calibration port covers in a safe place.
2. Set the unit on a level surface at one end of the range. Position it with the side facing the wall. The calibration port should be facing away from the wall.
3. Turn on the power and the level laser beam. Select Dither/Scan mode (at the shortest line length) for best laser beam visibility. If the beam is not visible, use the laser detector to locate the beam.
4. Mark the height of the laser beam (center of the laser beam) on the vertical surface of the wall as A.



5. Rotate the unit 180 degrees, taking care not to change the height of the device. The laser unit should be positioned with the other side of the unit facing the same vertical wall as in step 2. Use the level Line Dither/Scan position arrows to position the laser beam on the original wall.
6. Mark the height of the laser beam on the same vertical surface as B.



If this second marking is positioned at the same height as the mark made in step 4, proceed to step 11. Otherwise, continue to step 7.

The goal of the next few steps is to position the level beam at a height halfway between the marks made in steps 4 and 6.

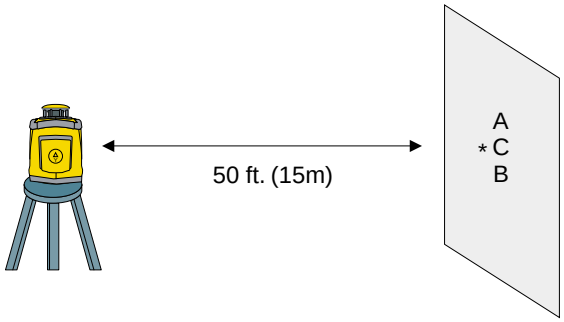
7. Turn off the laser beam and the power to the unit.

   ❖ Caution: The laser beam must be turned off and the power switch in the off position before proceeding to the next step.

8. Insert an Allen wrench into the side calibration port and locate the calibration screw. Rotate it clockwise to lower the beam or counterclockwise to raise the beam.
9. Remove the Allen wrench from the calibration port. Turn the power on, turn on the level laser beam, and check the height of the laser beam. Repeat steps 7 and 8 until the beam is at a height exactly halfway between marks A and B.

   ❖ Caution: The Allen wrench must be removed from the calibration port before running the power on.

10. Mark this calibrated point on the surface as C.

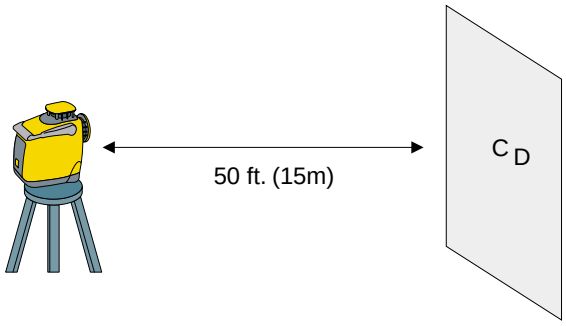


11. Repeat steps 3–7 to confirm the position of C, then proceed to step 12.
12. Rotate the laser unit 90 degrees and position the it with the front facing the vertical surface. Mark the height of the laser beam as D.

13. Compare the height of D with C. If the height of D matches the height of C, calibration is complete. Turn the power switch to the off position. Screw back the calibration port covers and resume normal operation. If the height of D does not match the height of C, proceed to step 14.
14. Turn off the laser beam and the power to the unit.

   ❖ Caution: The laser beam must be turned off and the power switch in the off switch before proceeding to the next step.

15. Insert an Allen wrench into the front calibration port and locate the calibration screw Rotate it clockwise to lower the beam or counterclockwise to raise the beam.
16. Remove the Allen wrench from the calibration port. Turn the power on, turn on the level laser beam, and check the height of the laser beam. Repeat steps 14 and 15 until the beam is at the height of mark C.



❖ Caution: The Allen wrench must be removed from the calibration port before turning the power on.

Calibration is complete.

17. Turn the power switch to the off position. Screw back the calibration port covers and resume normal operation.

✍ Note: Complete calibration of the level laser beam automatically calibrates the plumb laser beam. Separate calibration of the plumb laser beam is not required.

Care and Maintenance

The RT-7690-2 laser system is a product of superior design and manufacture, and should be treated with care. The following guidelines will help the user fulfill warranty obligations and enjoy this product for many years. When using the device:

- Keep it and all its parts and accessories out of the reach of small children.
- Do not store it in dusty or dirty areas. Although the RT-7690-2 base unit is dust- and dirt-resistant, long-term exposure to these elements may damage internal moving parts.
- Keep it dry. Although the RT-7690-2 laser is water-resistant, precipitation, humidity, and liquids which contain minerals that corrode electrical circuits can still enter the device.
- Do not store it in hot areas (above 158°F or 70°C). High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store it in cold areas (below 14°F or -10°C). When the device warms up to its normal operating temperature, moisture can form inside the base unit and/or RF remote control/laser detector, where it may damage the circuit boards.
- Do not attempt to open it. To avoid damage, the unit should be opened only by qualified service personnel.
- Do not drop, knock, or shake it. Rough handling will impact calibration accuracy.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean it. Wipe the unit with a soft cloth, slightly dampened in a mild soap-and-water solution.
- Keep the base unit laser aperture windows clean by periodically wiping them with a lint-free swab moistened with denatured (rubbing) alcohol.

Limited Warranty

Toolz warrants for a period of one (1) calendar year from the date of purchase that its products are free of defect in material and workmanship, and conform to Toolz's published technical specifications under normal operating conditions.

This Warranty is void and does not apply if the product has been damaged by accident, abuse, misuse, normal wear and tear, or if the product has been modified, altered, or the case opened, or is repaired by anyone other than Toolz or its authorized repair center(s).

Toolz will, at its option and expense, repair or replace any products found to be defective under the above warranty. Repairs and replacement units may contain new and/or reconditioned components.

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Specifications

Accuracy:	Level: ±1/8" (.3 mm) @ 100 ft. (30m) Plumb: ±1/4" (.6 mm) @ 100 ft. (30m)
RF remote control/ laser detector range:	300 ft. (90m)
Leveling mode:	Level and plumb self-leveling
Self-leveling range:	±6 degrees
Operating modes:	Spin and Line Dither/Scan
Spin Rotation:	Three speeds (350, 600, and 1200 rpm)
Line Dither/Scan:	Six line lengths
Plumb alignment (Spin mode):	±2.0 degrees
Level and plumb positioning (Line Dither/Scan mode):	360 degrees
Power supply	
Base unit:	AC adapter or four “D” batteries (alkaline or non-alkaline)
RF remote control/ laser detector:	9V battery (alkaline or non-alkaline)
Low battery indicator	
Base unit:	Yellow LED flashes on for three seconds/off for one second Five hours of use remaining
RF remote control/ laser detector:	LCD display icon
Out-of-level indicator:	Flashing red LED in sync with laser and beeper once per second
Base unit Power Standby mode:	Activated after 25 minutes of no activity Indicated by rapidly flashing green LED
RF remote control/laser detector standby mode:	Activated after 20 minutes of no activity (no button press or laser beam detection)
Laser output:	Two 635 nm, 5 mW maximum
Laser classification:	Class IIIA
Environmental:	Dirt, dust, and water resistant
Temperature range	
Operating:	14°F (-10°C) to 113°F (450°C), with automatic laser shutoff at 1134°F (45°C)
Storage:	14°F (-10°C) to 158°F (70°C)
Tripod mount:	5/8" x 11"
Dimensions:	8" x 6" x 6" (20.32 cm x 15.24 cm x 15.24 cm)